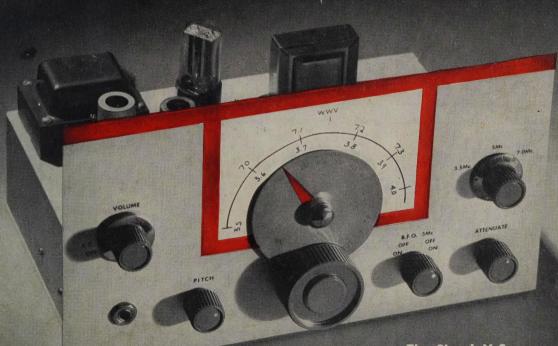
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The SimpleX Super See Page 11 of This Issue

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Once again it is our privilege to express the best wishes of the entire Hallicrafters family through the words of "A Christmas Bonus." It was written in 1956 by the late Cyrus T. Read, W9AA — a loyal friend of amateur radio whose entire life reflected the spirit of ". . . good will toward men."

Bill Halligan, Jr.

11-111-111-111-111-111-111-11

## A Christmas Bonus

**7** THE DAY BY DAY PURSUIT of our hobby we radio amateurs have a wonderful time. The fascination of experimenting with new circuits and equipment — the thrill of DX — the organized teamwork of net operation — the excitement of Field Day, Sweepstakes, the DX Contest — all combine to make ours an incomparable avocation. In the midst of such absorbing interests it may be that we fail to remember the one enduring reward which comes to all of us through our amateur activity.

THAT REWARD is the many lifelong friendships which we all establish directly or indirectly through amateur radio. From the day we start to work toward an amateur license we begin to make new friends. Some may live near enough to help in learning the code, building equipment, or putting up an antenna. Others are so far away that we never hope to see them in person. None-the-less, near or far, they are all close friends. Most of us have had the heartwarming experience of visiting some distant place, calling on an amateur whom we knew only through contacts over the air, and being welcomed like one of the family.

We at Hallicrafters like to feel that those interested in amateur radio are our friends. And, at this particular season, we want to extend to all amateur enthusiasts, everywhere, our sincere best wishes for a Very Merry Christmas and a Happy New Year.

Vy 73,
—CY READ, W9AA

Bulfallyin Jr. W. J. Hoelingon W9AC for hallicrafters

【】【《戏戏》:《我说《我以说我》。我以《我以《我以《我以《我以《我以《我以《我以《我以《我以《我》。《《《《我》。《我以《我以《我》。《《《《《》。《《》。《《》。《《》。《《》。《《》。《》。《《

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## DECEMBER 1958

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# Christmas Greetings

from all of us to you

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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in QST. ARRL Field Organization station appointments are available in the areas shown to qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. These include ORS, OES, OPS, OO and OBS, SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. OES appointment is available to Novices and Technicians.

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# THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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## "It Seems to Us..."

#### **MISINFORMATION**

In recent weeks several rumors and other forms of distorted fact have crossed the editor's desk—sufficiently widespread, we think, to

require correction.

In some quarters there are cries of alarm that the 15-meter band is being taken away from amateurs, or at least being moved somewhere else, and that the League is meekly acquiecsing to this outrage without a fight. We can tag that one quickly—someone left off his bifocals when he read a QST item dealing with the 21,000-Mc. (not kilocycles) band and its FCC-proposed move to 22,000 megs, in which the League concurred. There is no

change proposed at 15 meters.

We have received letters of indignation from Technicians that the League is not looking out for their interests. This is obvious, they say, because ARRL concurred in an FCC proposal (actually, an alternate version of a League petition to tighten licensing procedures) which would "require all Technicians to be re-examined by an FCC engineer or lose our tickets." Wrong again, OMs. The proposal, in which the League did indeed concur, simply gives the Commission authority, at its discretion, to call up Technicians (and Novices, too) for personal examination. It is precisely the same procedure applying for many years to Conditional Class licensees, and therefore only puts all mail-system licenses on an equal basis. FCC seldom has to use this authority, and does so only in cases where a "mail order" amateur is cited several times for regulatory violations to the point where his actual qualifications for the license are open to question, or whenever other information available to the Commission similarly casts sufficient doubt on the amateur's real ability. No wholesale reexamination is contemplated.

Some of our Technicians have also misunderstood another current FCC proposal which, among other things, would authorize 6F2 (essentially, audio-frequency-shift keying) in the 50-Mc. band. Once again the cry is that Technicians are losing privileges. Not so! No Technician privilege will be withdrawn under the proposal. The new form of emission, assuming its adoption, will be equally available

to Techs if they want to use it.

Nor is the printed page immune to misinformation. One esteemed contemporary just published a quiz, sent in by a radio club, which included some amateur regulatory questions. Good idea but the wrong dope in the case of an

example that is likely to be run into by hundreds of amateurs. The published answer to one question is that if you're going to engage in portable operation away from home for more than 48 hours you don't need to send in prior written notice to the Engineer in Charge of the radio inspection district in which such mobile operation is intended. (A QST reference is even given as authority.) Not so, OMs. You do have to give such notice; the guy who read the QST reference misread it. The FCC still requires such notice; the action which the FCC took and which has been erroneously interpreted in this case merely eliminates the requirement of continuing the old monthly notices on extended trips under certain conditions; the initial notice for over-48-hour operation is still required and you'd better make sure you send it in if you don't want to get into hot water. To be on the safe side, consult Sections 12.90, 12.91 and 12.93 of the Amateur Rules if you plan on operating either portable or mobile away from home for more than 48 hours. What! You don't have a License Manual? Better get one or make sure your club secretary has an up-to-date version! (50¢ at your dealer's or postpaid from ARRL.)

#### ARL FIFTY-EIGHT

From time to time in this section we like to bring up the public relations aspects of our hobby. Not the least of numerous ways in which the public comes in contact with amateur radio is our handling of messages, and this month traffic on the amateur nets will swell to its Holiday peak. One p.r.-minded club is setting up an amateur station at each of several shopping centers in a large eastern city, offering our message service.

If handled efficiently, this can be an excel-

If handled efficiently, this can be an excellent way to call the favorable attention of non-amaturs to the usefulness of ham radio. On the other hand, if such an operation is poorly run — if relaying arrangements are not carefully planned in advance, if amateurs along the way are lackadaisical in forwarding the messages — the total impression will be exactly the opposite of what we seek to achieve.

So pitch in — make it a point to be in your section net as often as possible this month. Accept message traffic for your town or immediate area. Until delivered, a message on the amateur bands is a liability. After prompt and courteous delivery, you have added an important nail to the structure of public service.

## Hamfest Calendary

California — Everyone is invited to attend the annual Christmas Dinner of the San Francisco Radio Club at the New Tivoli Restaurant, 1438 Grant Avenue, San Francisco, on Saturday night, December 20, at 7:00 p.m. Tickets are \$2.50 per person. For reservations or further information, please contact Harry Witzke, WV6CVJ, 1256 Masonic Avenue, San Francisco. Phone Underhill 1-5650.

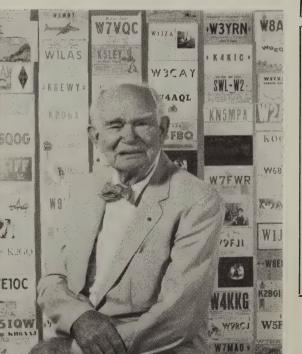
Maryland — The Chesapeake Amateur Radio Club will run a transmitter hunt on Sunday, December 14, starting at one P.M. The starting point will be the Food Fair parking lot, Hillendale Shopping Center, Loch Raven Boulevard and Taylor Ave., Baltimore. The hunt will be on 28.88 Mc. There will be refreshments, and prizes to the winners.

## Strays 🐒

Earlier this year, through the efforts of a number of people, amateurs all over the country sent greetings on his 85th birthday to Dr. Lee De Forest. At the ARRL National Convention the Potomac Valley Radio Club collected hundreds of personal, signed messages which were forwarded to the doctor. W8BAH suggested a campaign of birthday greetings on QSL cards and subsequent to a W1AW bulletin hundreds of QSLs were delivered to Dr. De Forest.

A 30-minute tape was recorded by Dr. De Forest, thanking amateurs for their thoughtfulness on his birthday. On the tape Dr. De Forest also recounts many of his early experiences in radio. We have the master copy here at the Headquarters, and it is simply fascinating to hear. This tape is available from our Training Aids section to all affiliated clubs—it will be interesting to old-timer and newcomer alike. The actual recording was done by W6MBD, recording supervisor at 20th Century-Fox.

In the photograph below Dr. De Forest is sitting before some of the thousands of QSLs and messages that he received for his 85th birthday, cards that meant a great deal to him.



Holiday greetings from all of the Headquarters staff! We can't send a personal card to each and every one of you, but it is with pleasure that we do send you this, the largest issue in *QST*'s history.

## HAMS AT HEADQUARTERS W1AW, ARRL Headquarters Station

The following list shows the present calls and former calls (if any) of the Headquarters gang:

W1BDI F. E. Handy (1XAH, 8BCM)
W1BUD A. L. Budlong (1ASN, W1JFN)
W1CIE Constance Campbell

W1CUT E. Laird Campbell (W5TQD)
W1DF George Grammer (3AIH, 3ARJ)
W1DX Byron Goodman (W6CAL, W1JPE)

W1FEA Belden Morgan, jr.
W1FGF Ronnie Gann
W1HDQ E. P. Tilton

W1ICP L. G. McCoy (W9FHZ, WØICP)

W1IKE Richard L. Baldwin W1JMY J. A. Moskey W1LLF Robert A. Smith

W1LVQ John Huntoon (W9KJY) W1NJM George Hart (W3AMR, D4ALS) W1QIS Murray Powell (1BHQ)

W1TS D. H. Mix (4DM, 9AT)
W1TUW David Cabaniss (CN8IID)
W1UED Perry Williams

W1VG L. A. Morrow (8AOF, 1VC, 8BZJ, 8BAB, W8JNI, W8DKE, W9VKF)

WIVLH Mason P. Southworth

W1WPO R. L. White (W6QEZ, W6YYN, W2-QPZ, KH6QJ)

W1WPR C. R. Bender (W3ODU)

W1YYM Ellen White (W6YYM, W2RBU, KH6QI)
W1ZDP Phil Simmons (W3VES, W9VES)

W1ZIF Kenneth Lamson W1ZIM Miriam Knapp W1ZJE Lillian M. Salter

#### William A. Ladley, WGRBQ

It is with extreme regret we report the passing of William A. Ladley, W6RBQ, Director of the Pacific Division of the League from October 21, 1946 to January 1, 1950. Bill had also served as Section Communications Manager for the San Francisco section from December 15, 1943, through February 15, 1946, and had been a director of the San Francisco Radio Club. He held appointments as Route Manager, Official Relay Station and Official Bulletin Station in the League's operating organization, and was a member of the A-1 Operators' Club and the Amateur Radio Emergency Corps. He had also served as a captain in the California State Guard. Not so active in recent years due to ill health, Bill will nevertheless be deeply missed, especially by the old-timers in the San Francisco area.

The SimpleX Super receiver uses three dual tubes and a crystal filter to cover the 80- and 40-meter bands, and it can tune to 5 Mc. for copying WWV. The dial scale is made from white paper held to the panel by red Scotch tape; the pointer is a slice of the tape.



## The "SimpleX Super" Receiver

BY BYRON GOODMAN,\* WIDX

N several occasions when the author has played around with one of the inexpensive (under \$100) short-wave receivers, he has wondered how many new amateurs handicap themselves through the false economy of buying such a receiver. The mere thought of struggling through a QSO in a crowded band with one of these toys is enough to make seasoned amateurs weep. Any such experience would certainly justify a beginner's wondering how anyone can get enjoyment out of ham radio. Frankly, these receivers are aimed at the short-wave listener market, not the radio amateur. The receivers aren't too bad for their intended purpose of copying the louder short-wave broadcast stations, but they smell in spades as "communications receivers" if you have ham communications in mind.

The 3-tube receiver to be described will permit the single-signal reception 1 of code signals. Single-sideband phone can be handled with no difficulty at all, even though the tuning rate is a bit faster than we would like. With the b.f.o. turned off for the reception of a.m. signals, a threshold effect shows up that prevents your digging all the way down for the weak ones, but you can still copy plenty of a.m. signals. Since the receiver uses only three tubes, it doesn't have the more-than-enough gain of a big receiver, and its performance won't be very impressive on a poor (short or low) antenna. However, if you use your transmitting antenna for receiving, as you should, you will find yourself backing down on the volume control to save your ears.

Referring to the circuit diagram in Fig. 1, the receiver is a superheterodyne with an intermediate frequency of 1700 kc. With the h.f. oscillator tuning 5.2 to 5.7 Mc., the 3.5- or the 7-Mc. amateur bands can be tuned merely by retuning the input circuit,  $L_1C_1$ . Since  $C_1$  is large enough to hit the two bands without a coil change, the band-changing process consists of turning  $C_1$  to the low- or high-capacitance end of its range. To copy WWV at 5 Mc., the oscillator must be tuned to 3.3 Mc., and this is done by switching in an additional capacitor across the oscillator circuit.

If you are disappointed because the receiver doesn't tune the 21-Mc. band, remember that the "under-\$100" receivers don't either. Sure, the dials show 21 Mc., but try to use the receivers to hold a signal for any length of time! The SimpleX Super, with a crystal-controlled converter 2 be-

 $^2$  McCoy, "The 'Bonus' 21-Mc. Converter,"  $\mathit{QST},$  Oct., 1958.

The name of this receiver derives from "simple," "X" for crystal (filter), and "super" for superheterodyne; hence a "simple crystal-filter superheterodyne." For about \$50 and a few nights at the work bench this little receiver will allow you to copy practically any c.w. or s.s.b. signal in the 40- or 80-meter band that a much more expensive receiver might drag in. By the flip of a switch you can tune to 5 Mc. for WWV, a stunt some more-expensive receivers can't do!

<sup>\*</sup> Assistant Technical Editor, QST.

<sup>&</sup>lt;sup>1</sup> Single-signal reception requires a receiver with sufficient selectivity so that setting the b.f.o. frequency of the mid-frequency of the i.f. gives a stronger signal on one side of zero beat than on the other. An excellent c.w. receiver will show no trace of signal on "the other side" of zero beat.

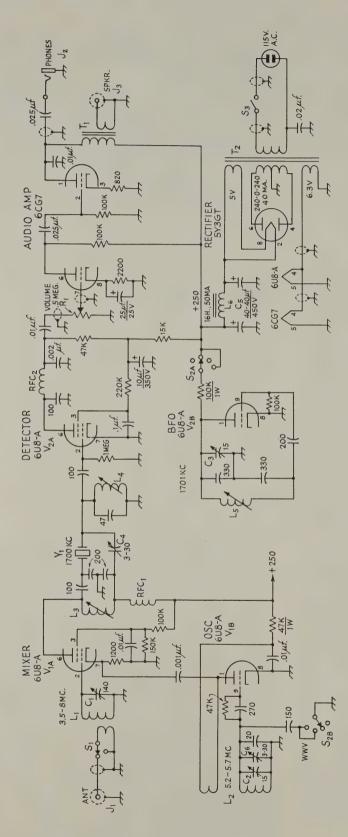


Fig. 1—Circuit diagram of the SimpleX Super receiver. Unless otherwise indicated, capacitances are in  $\mu\mu f_{\nu}$ , resistances are in ohms, resistors are  $^{1}\!\!\!/_{\nu}$  wath. Polarity shown on electrolytic capacitors, fixed capacitors 330  $^{1}\!\!\!/_{\nu}$  to less are silver mica or NPO ceramic. Nonelectrolytic fixed capacitors over 0.025  $\mu f_{\nu}$  are 400-volt molded tubulars. Fixed capacitors 0.001 through 0.025 are ceramic.

 $C_1-140$ - $\mu\mu$ f. midget variable (Hammarlund APC-140-B),  $C_2-15$ - $\mu\mu$ f. midget variable (Hammarlund HF-15).

 $C_3 - 15 - \mu\mu f$ , trimmer (Hammarlund MAPC-15-B),  $C_4$ ,  $C_6 - 3 - 30 - \mu\mu f$ , mica compression trimmer.  $C_5 - Dual + 40 - \mu f$ , 450-volt electrolytic (Mallory TCD-78

J<sub>2</sub>—Open-circu't headphone jack. L<sub>1,</sub> L<sub>2</sub>—See Fig. 2.

L<sub>3</sub>, L<sub>4</sub>—105–200-, h. slug-tuned (North Hills 120-H coil mounted in North Hills 5-120, shield can).

L<sub>5</sub>—36-64-µh. slug-tuned (North Hills 120-F coil mounted in North Hills S-120 shield can). L<sub>0</sub>—16-hy. 50-ma. filter choke (Knight 62-G-137 or equiv.)

 $R_1-V_2$  megaha volume control, audio taper, with switch.

RFCJ, RFC2—2.5-mh. r.f. choke (Waters C1155).

S1—1-pole 12-position (2 used) rotary ceramic switch (Centralab PA-2001).

S2—2-pole 6-position (4 used) rotary ceramic switch symbol.

(Centralab PA-2003).

 $S_3$ — $S_5$ ,p.s.t. switch, part of  $R_1$ .  $T_1$ —10,000-ohms-to-voice-cail output transformer (Stancor A-3822 or equiv.).

 $T_2$ —480 v. c.f. at 40 ma., 5 v. at 2 amp., 6.3 v. at 2 amp. (Knight 62-G-034 or equiv.).  $Y_1$ —1700-kc. crystal in FT-243 holder (E. B. Lewis or

equiv.).

(All radio stores do not handle the above components. For prices and names of dealers write to North Hills Electric Co., 402 Sagamore Ave., Mineola, N. Y.; Knight is handled by Allied Radio, 100 N. Western Ave., Chicago Moss.; E. B. Lewis, 11 Bragg St., E. Hartford, Conn.

1, J3-Phono jack.

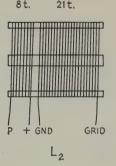
Fig. 2—Details of the coil construction. Each one is made from B & W 3016 Miniductor stock, which is wound 32 t.p.i. and 1-inch diameter. The separation between coils in  $L_1$  is 7 turns; the separation between coils in  $L_2$  is 1 turn. It is important that the coils be connected as indicated.

The Miniductor stock can be cut into the required lengths by pushing in a turn, cutting it inside the coil and then pushing the newly-cut ends through to outside the coil. Once outside, it is easy to peel away the wire with the help of long-nose pliers. When sufficient turns have been removed, the support bars can be cut with a fine saw.

ANT GND GRID

26 t.

6t.



tween it and the antenna, will handle 15 meters like 80.

Selectivity at the i.f. is obtained through the use of a single crystal. Although not as sharp as the usual 455-kc. crystal filter, it is sharp enough to provide a fair degree of single-signal c.w. reception and yet broad enough for good copy of an s.s.b. phone signal.

In the detector stage, the pentode section of a 6U8A is used as a grid-leak detector, and the triode section serves as the b.f.o. Stray coupling at the socket and in the tube provides adequate injection. Audio amplification is obtained from the two triode sections of a 6CG7. The primary of a small output transformer,  $T_1$ , serves as the coupling for high-impedance headphone output, and a small loudspeaker or low-impedance headphones can be connected at the output winding of the transformer. Although the audio power output is less than a watt, it is sufficient to drive a loudspeaker adequately in a small quiet room.

The power supply uses a large choke and two 40- $\mu$ f. capacitors, and the very slight hum that can be detected in the headphones with the volume full on is stray a.c. picked up by the detector grid; it doesn't come from inadequate filtering of the power supply. (The hum can only be heard with no antenna on; under normal operation the incoming noise will mask the slight hum.)

A switch at the input of the receiver is included so that the receiver can be used to listen to one's own transmitter without too severe blocking. Using the b.f.o. switch to cut in the WWV padder looks stupid, but it was done this way (instead of by the more logical  $S_1$ ) to keep the input short-circuiting leads short.

#### Construction

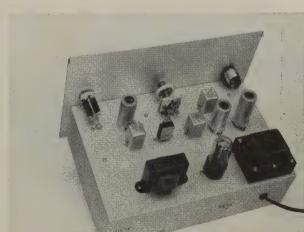
An  $8 \times 12 \times 3$ -inch aluminum chassis takes all of the parts without crowding, and the location of the components can be seen in the photographs. The  $7\frac{1}{2} \times 13$ -inch aluminum panel ( $\frac{1}{16}$ -inch thick) is held to the chassis by the b.f.o. capacitor mounting screws, the phone jack, the

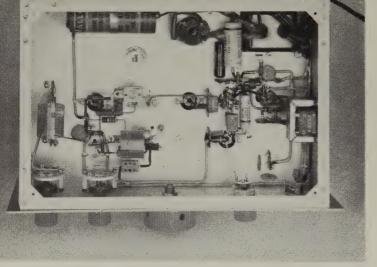
Top view of the SimpleX Super. The tube between the two variable capacitors is the mixer-oscillator 6U8A; the 6CG7 audio amplifier is at the far right. The flexible insulated coupling between main tuning dial and the tuning capacitor is a Millen 39016.

dial drive and the two rotary switches. The tuning capacitor  $C_2$  is mounted on a small aluminum bracket made from an extra strip of the panel material; before the bracket is finally fastened to the chassis the capacitor and bracket should be used to locate the dial hole on the panel. When drilling the hole for the dial drive, measure the dimension instead of using the template provided with the National K dial. It pays to take care in mounting the tuning capacitor and the dial, since a smooth tuning drive is an essential in any receiver. To facilitate tuning, a National HRT knob was used instead of the puny knob furnished with the K dial. The other knobs are gray National HR and HR-4.

Tie points were used liberally throughout the receiver, as junctions for components and interconnecting wires. The coils  $L_1$  and  $L_2$  were mounted on the points, using short leads. If the leads from  $L_2$  are too long, the coil will be "floppy" and the receiver may be unstable. Fig. 2 shows how coils  $L_1$  and  $L_2$  are constructed and connected. The leads from  $C_1$  and  $C_2$  are brought through the chassis in insulating grommets. The 3- to 30- $\mu\mu$ f, mica compression trimmer across  $L_2$  is soldered to the tie points that support the coil.

The receiver was wired with shielded wire for many of the leads, in an effort to minimize hum in the audio and feedthrough around the crystal filter. The shielded leads are marked in Fig. 1 where feasible; the simple rule to follow is to shield all B+ leads along with those shown shielded in Fig. 1. For ease of wiring, these shielded leads should be installed first or at least early in the construction. As the wiring progresses, a neat-looking unit can be obtained by





Shielded wire, used for most of the d.c. and 60-cycle leads, lends to the clean appearance underneath the chassis. The switch at the left shorts the input of the receiver, and the adjacent switch handles the b.f.o. and the padding capacitor for WWV.

Phono jack at the top left is for the antenna; the other phono jack is for low-impedance audio output. The headphone jack (lower right) is for highimpedance audio output.

dressing the leads and components in parallel lines or at right angles. D.c. and a.c. leads can be tucked out of the way along the edges of the chassis, while r.f. leads should be as direct as is reasonable.

If this is your first receiver or construction job, there are several pitfalls to be avoided. When installing a tube socket, first give a little thought to where the grid and plate leads will run, and orient the socket so that these leads will be direct and not cross over the socket. Believe it or not, we have seen i.f. amplifiers where each grid and plate lead had to cross over the socket to get to its respective transformer. The builder couldn't understand why the amplifier "took off" the instant the gain was advanced slightly.

Another thing to look out for is the wellmeaning store clerk who sells you stranded wire for making the connections throughout the receiver. The only stranded wire in this receiver is in the leads from the transformers, filter capacitor and filter choke, and in the shielded wire, and all this only because there was no choice. Where stranded wire is used, be very careful to avoid wild strands that stray over to an adjacent socket terminal and short-circuit a part of the circuit without your knowing it. No. 20 or 22 insulated solid tinned copper wire should be used for connections wherever no shielding is used. Long bare leads from resistors or capacitors should be covered with insulating tubing unless they go to chassis grounds.

The final bugaboo is, of course, a poorly-soldered connection. If this is your first venture, by all means practice soldering before you start to wire this receiver. Read an article or two on how to solder, or get a friend to show you how and to criticize your first attempts. A good soldering iron is an essential; we have seen instances of a first venture having been "soldered" with an iron that would just barely melt the solder; the iron was incapable of heating the solder and work to the point where the solder would flow properly. There is no need to worry about the dial scale

<sup>3</sup> McCoy, "How To Solder," QST, Sept., 1958.

when the receiver is first built, because the receiver has to be checked. The scale is a sheet of white paper held in place by red or black Scotch tape. The pointer on the dial is a slice of the same tape.

#### Adjustment

When the wiring has been completed and checked once more against the circuit diagram, plug in the tubes and the line cord and turn on the receiver through  $S_3$ . The tube heaters and rectifier filament should light up and nothing should start to smoke or get hot. If you have a voltmeter you should measure about 250 volts on the B+ line.

With headphones plugged in the receiver, you should be able to hear a little hum when the volume control is advanced all the way. If you can't hear any hum, touching a screwdriver to Pin 2 should produce hum and a loud click. This shows that the detector and audio amplifier are working.

The next step is to tune  $L_3$ ,  $L_4$  and  $L_5$  to 1700 kc., the crystal frequency. If you have or can borrow a signal generator, all you have to do is to put 1700-kc. r.f. in at the grid of the 6U8A mixer and peak  $L_3$  and  $L_4$ . Lacking a signal generator, you may be lucky enough to find a strong signal by tuning around with  $C_2$ , but it isn't likely. Your best bet is to tune a broadcast receiver to around 1245 kc.; if the receiver has a 455-kc. i.f. the oscillator will then be on 1700 ke. Don't depend upon the calibration of the broadcast receiver; make your own by checking known stations. The oscillator of the broadcast receiver will furnish a steady (possibly hummodulated) carrier that can be picked up by running a wire temporarily from the grid of the 6U8A mixer to a point near the chassis of the b.c. receiver. Adjust  $L_5$  until you get a beat with the 1700-kc. signal, and then peak  $L_3$  and  $L_4$ . If the signal gets too loud, reduce the signal by moving the wire away from the b.c. receiver. Now slowly swing the signal frequency back and

(Continued on page 198)



## The Novice 50 Watter

A FEW YEARS AGO the author described a one-tube high-power (Novice-style high power!) transmitter<sup>1</sup> that many Novices built and used with considerable success. Since then, several hams have written asking how to use a pi-network tank circuit in the rig. The transmitter shown in the photographs and Fig. 1 is such a rig. As in the earlier version, a 6146 is used in the oscillator and can be operated at approximately 50 watts input, crystal-controlled, on either 80 or 40 meters.

#### Circuit Details

The oscillator is of the Colpitts variety with the output taken from the plate of the 6146. A

\* Technical Assistant, QST.

#### 80 and 40 Meters With a Single 6146

BY LEWIS G. McCOY,\* WIICP

Sweet and simple. That's an apt description of the transmitter shown here. If you are interested in building your first rig, this unit should fill the bill. It is easy to build, packs a solid punch, and provides plenty of watts per dollar.

Photo above: This view of the 50 watter shows the panel arrangement and layout of the components above chassis. The crystal is between the 6146 and dial-light grommet. Behind the 6146 is the power transformer and to its right is the rectifier tube.

2-volt, 60-ma. dial lamp is connected in series with the crystal, and the lamp serves as an indicator of crystal current, and doubles as a fuse in the event the crystal current becomes excessive. In the tank circuit, the coil  $L_1$  is used in its entirety for 80-meter operation; a portion is shorted out when the transmitter is adjusted for 40 meters. On 80,  $S_1$  is used to switch in  $C_3$ , a 680- $\mu\mu$ f. mica capacitor. This capacitor is connected in parallel with  $C_4$  which is a dual 365- $\mu\mu$ f. variable. The stators of  $C_4$  are connected together and, with  $C_3$ , provide a maximum capacitance of approximately 1400  $\mu\mu$ f. This is adequate on 80 meters for working into 50-ohm loads. On 40,  $S_1$  shorts out a portion of  $L_1$  and removes  $C_3$  from the circuit.

The power supply has a capacitor-input filter circuit and gives approximately 400 volts d.c. under a load of 125 ma.

#### Building the Transmitter

Study the photographs and Fig. 1 before starting construction. There is nothing critical about the layout of the components but it is a good idea to build your rig along the same lines as the unit shown. Before going into details of construction there are a few points that should be mentioned to make the job easier for the beginner.

 $<sup>^1</sup>$  McCoy, "One Tube — 80 and 40 Meters — 75 Watts,"  $QST,\,\mathrm{Aug.},\,1955.$ 

If this is your first wiring job we suggest you read an article on soldering that appeared in a recent issue of  $QST.^2$  Briefly, be sure to use resin core solder (not acid core). Also, use a soldering iron that will deliver plenty of heat. Make sure that all wires and connections to be soldered are clean before soldering.

If you look at the bottom view you'll notice that all the components—resistors, coils and so forth—are mounted *parallel* to the chassis sides. If you remember to mount the components parallel to the sides you'll end up with a piece of equipment that you can be proud of.

The rig shown here was built on a  $3 \times 7 \times 11$ -inch aluminum chassis. Look at the top and bottom views of the rig and note that the power-supply components are mounted along the back of the chassis. The transformer and rectifier tube are mounted above chassis while the remaining supply components are below deck. At one end of the chassis, below deck, the filter choke is mounted against the side wall. The electrolytic

capacitors are installed on the back wall. Remember to observe correct polarity when wiring in the electrolytics. You'll find a "+" mark at one end of the capacitor and the leads from this end must be connected to the filter choke side of the B-plus line. The other ends, or "-" leads, should be connected to chassis ground.

Install a half-inch-diameter rubber grommet at one end of the chassis top. This grommet is used to hold the dial lamp  $I_1$ . The crystal socket should be installed between the grommet and the 6146 socket. The pi-network components,  $C_2$ ,  $L_1$  and  $C_4$  are mounted at the opposite end of the chassis.  $C_2$ , the variable tank capacitor, is mounted closest to the 6146 socket. The tank coil  $L_1$  mounts between  $C_2$  and  $C_4$ , supported by its leads. Also between the two variables is  $S_1$ , which is mounted on the chassis front. An RCA type phono jack is used for the output terminal  $J_2$ . It is mounted on the rear of the chassis, directly behind  $L_1$ .

Wiring

Although there is no rule about what should be

Fig. 1 — Circuit diagram of the Novice 50 watter. Unless otherwise specified, capacitances are in  $\mu\mu$ f. Capacitors marked with polarity are electrolytic. Capacitors not otherwise identified are disk ceramic.

 $C_1$ —470- $\mu\mu$ f. mica capacitor.

C $_2$ —250- $\mu\mu$ f. variable capacitor (Hammarlund MC-250M).

 $C_3$ —680- $\mu\mu$ f. mica capacitor.

 $C_4$ —365- $\mu\mu$ f.-per-section dual variable capacitor, broadcast-replacement type, sections connected in parallel (Allied Radio 60H725).

 $I_1$ —Dial lamp, 2 volts, 60 ma., No. 48 or 49.

J<sub>1</sub>—Key jack, open-circuit.

J<sub>2</sub>—RCA type phono jack.

L<sub>1</sub>-35 turns of No. 18, 11/4-inch diam., 16 turns per inch,

tapped 15 turns from the  $C_4$  end (B & W No-3019).

L<sub>2</sub>—9-hy. 125-ma. filter choke (Triad C-10X or equiv.).

R<sub>1</sub>—11,000 ohms 3 watts. (See text.)

R<sub>2</sub>—50,000 ohms, 2 watts. (See text.)

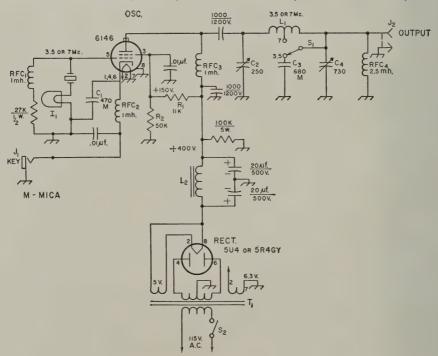
RFC<sub>1</sub>, RFC<sub>2</sub>—1-mh. r.f. choke (National R-50, Millen 34300–1000).

RFC<sub>3</sub>, RFC<sub>4</sub>—2.5-mh. r.f. choke (National R-100S).

S<sub>1</sub>—1-pole 2-position switch (Centralab No. 1460).

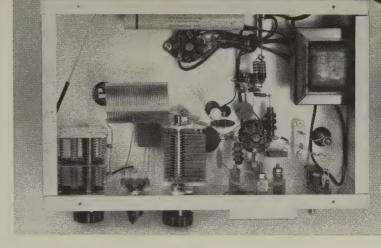
S<sub>2</sub>—Single-pole single-throw toggle switch.

T<sub>1</sub>—750 volts, c.t., 150 ma., 5 volts 3 amp., 6.3 volts, 4.5 amp. (Stancor PC-8411 or equiv.).



<sup>&</sup>lt;sup>2</sup> McCoy, "How To Solder," QST, Sept., 1958.

This view shows the arrangement of the components below chassis. At the far right, mounted against the side of the chassis, is  $L_2$ , the power-supply choke. The filter capacitors are mounted along the back wall. At the lower left is  $C_4$ , the output capacitor. The other variable is  $C_2$ .



wired first, it is a good idea to complete the power-supply wiring before tackling the r.f. When you mount the transformer on the chassis and see all the leads that can get in your way, you'll quickly understand why it is a good idea to do the power wiring first.

The screen voltage-dropping resistor  $R_1$  consists of three 33,000-ohm 1-watt resistors connected in parallel, and  $R_2$  is two 100,000-ohm 1-watt resistors in parallel. If desired, 10,000-ohm and 50,000-ohm 10-watt resistors can be used. The 100,000-ohm bleeder resistance across the output of the power supply (shown on the diagram as 100 K, 5 watts) is made up of three 33,000-ohm 2-watt resistors in series.

On the 6146 socket the three cathode pins, 1, 4, and 6, should be connected together and the leads from  $C_1$  and  $RFC_2$  should be soldered to any of the three pins.

On  $S_1$ , the center terminal connects to the stators of  $C_4$ . The 40-meter tap from  $L_1$  goes to one outside terminal on  $S_1$ , and the mica capacitor  $C_3$  goes to the other terminal.

#### Operation

After completing the wiring, check all connections to make sure you haven't made a mistake. When you feel you are ready to try the transmitter, plug in the key, an 80-meter crystal, the line cord, and turn the power on. Leave the key open until the 6146 warms up. Oh yes, you probably won't be putting an antenna on the rig until you're sure it works, so you'll need a dummy load connected to the output terminals. A 40-watt light bulb makes a good load, the threaded portion connecting to the chassis ground and the base pin to the output lead.

Switch  $S_1$  to the 80-meter position and set  $C_4$  at maximum capacitance (plates fully meshed). Close the key and tune  $C_2$  for a "dip" in meter reading. Once you've resonated the tank circuit by tuning  $C_2$  to a dip, you may or may not find that the lamp lights. Also, the meter reading at the dip will probably be only 20 or 30 ma. By decreasing the capacitance of  $C_4$  and redipping with  $C_2$  you'll find that the lamp will get brighter and the loading heavier, as indicated

by an increasing meter reading at the dip point. Be careful not to hold the key down any longer than necessary with the 6146 out of resonance as the tube is easily damaged during such operation. Increase the loading until the meter reads 100 to 125 ma. at the dip. This will be an input of approximately 50 watts, and the dummy load should be fairly bright. Under these conditions you should have approximately 400 volts on the plate of the 6146 and roughly 150 volts on the screen. Use an 80-meter crystal for 80-meter operation and a 40-meter one for 40. It is possible to use an 80-meter crystal for 40-meter work, but the oscillator will be operating as a frequency doubler and the output is less than when operating straight through at the crystal frequency.

No matter what type of antenna you plan to use, it is very important to take precautions to prevent harmonic radiation. This is particularly true of the second harmonic from 3.7-Mc. operation. As it stands, the transmitter will not provide adequate suppression of the second harmonic to assure that the user will stay out of trouble with the FCC. (Don't think this rig is unique in this respect; all transmitters have the problem of harmonic radiation). The answer is simply to use an antenna coupler,<sup>3</sup> preferably link-coupled, between the antenna and transmitter. Such a coupler will provide adequate second-harmonic attenuation and you won't be in danger of receiving a "QSL" from the FCC.

As far as TVI is concerned, there are only a few spots in the country where television interference would be a problem with the rig described here. While it is possible to have harmonic TVI from 80- to 40-meter operation, such cases of interference are rare. If you should experience such interference with the rig as described, it then would be necessary to put a shield over the 6146, install a bottom plate on the chassis, and use a low-pass filter.<sup>4</sup> This should eliminate all chances of TVI from the transmitter.

<sup>&</sup>lt;sup>3</sup> Complete details for construction and use of antenna couplers are given in *The Radio Amateur's Handbook*, Transmission Lines chapter.

<sup>&</sup>lt;sup>4</sup> See *The Radio Amateur's Handbook*, BCI-TVI chapter, for construction and use of low-pass filters.

### Wide-Band Moderate-Power Dummy Loads

Good High-Frequency Performance with Wire-Wound Resistors

BY DAVID T. GEISER,\* WA2ANU

''Noninductive'' wire-wound resistors are capable of handling more power than the composition types, but as a general rule are not sufficiently nonreactive to make predictable dummy loads at the higher frequencies. Here are some easily-built dummies using a simple method of reactance compensation, good for frequencies through the 144-Mc. band and transmitter power outputs up to 40-80 watts.

AMATEURS generally do not know how helpful a dummy load can be in the testing and adjustment of a transmitter. Commercial radio services use them for many purposes in ways that amateurs could imitate, and the purpose of this article is to discuss these uses and to show the construction of several adequate low-cost dummy antennas.

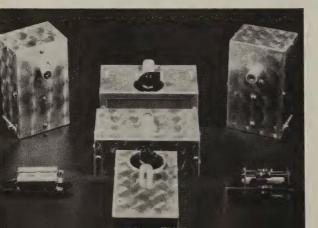
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Several uses of the dummy antenna are tracing TVI, testing transmitters, testing s.w.r. bridges, and testing transmission lines. This makes a fairly complete list, but there are also other benefits, for familiarity with the effects that go into the design of a good dummy antenna makes the use of resistors at radio frequencies a much less frustrating affair. Limiting the discussion to resistors that will handle some power and that amateurs can afford simplifies the discussion and allows space for both construction and theory talk.

#### Wire-Wound Resistors

When power resistors are mentioned, the natural first thought is the wire-wound style that has been used so long for bleeder and voltage-drop-

\* 202 Genesee, New Hartford, N. Y.



ping purposes. These resistors are available in a wide range of values, from a few ohms to thousands of ohms, in power ratings of a few watts to over 250 watts. Most of them are not satisfactory for easy r.f. use, being wound like an ordinary tuning coil, one turn beside the other, all in the same direction. There is, however, one type of resistor 1 made with a ceramic-insulated wire that permits winding layers on top of each other in opposed directions, without shorting turns. These relatively inexpensive resistors were used in the dummy antennas to be described because of their availability and fairly good frequency characteristics. While of a type called "non-inductive," these resistors (like any other component) will show capacitance and inductance as part of their impedance. Their use is usually limited to a few megacycles if neither inductance nor capacity effects are permissible.

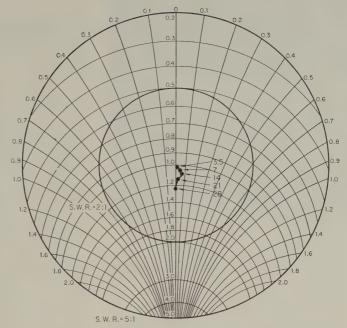
There are other types of resistors, some better and some worse for use at radio frequencies. The better resistors are usually of the film type (a metal film deposited on glass or some other insulator) but are more expensive and harder to obtain. Commercial dummy antennas use this form of resistor successfully to frequencies higher than 3000 megacycles, but the cost for power ratings as high as the units described here may be ten to twenty times greater.

Many other types of resistors have been used for dummies, the most common probably being the incandescent light bulb. While the light bulb certainly does change r.f. energy to heat, it shows drastic change of resistance with different power inputs. The ordinary light bulb, cold, has only 7 to 10 per cent of the resistance it has at normal operating temperature. Thus in the course of transmitter tune-up a 100-watt bulb might change from a value of 10 to 130 or more ohms. This is probably the most frustrating thing that can happen when it is desired to check changes in adjustments. (Something must stay constant to permit a comparison between two conditions.)

<sup>1</sup> Sprague Products Company NIT and NIS series.

Some of the wide-band dummy resistors developed in the course of the investigation. (Left to right, back row, 100 to 180 Mc., 0–80 Mc., 30–80 Mc.; center, composite 0–175 Mc.; front, 300-ohm 50-Mc. balanced, early 0–80 Mc., 100-ohm experimental.

Fig. 1—Impedance characteristics below 30 Mc. of the dummy shown in Fig. 2; capacitor dial set at 30 (100-division scale, with zero at minimum capacitance of the HF-50 capacitor used). This and the other charts in this article are presented in the form of Smith charts, with the actual impedance values normalized to the design value (50 ohms in the case above). Points in the area to the right of the vertical axis represent impedances having an inductive component; those in the lefthand area are capacitive.



A much better dummy was described by Grammer a few years ago using the heating element of a flatiron.<sup>2</sup> The r.f. characteristics were fairly good, but the resistance was quite low and a matching network was required to bring it up to a desired level. This required major retuning for each band. Occasionally other dummies have been described or offered for sale, but there is usually high cost, little application data, or poor availability.

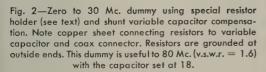
With these items in mind, an examination was made of the possibility of a home-assembled dummy antenna that had predictable characteristics. While working for Sprague, I had had many ham questions on the Sprague Non-inductive Koolohms referred to me. Repeated measurements showed that the most constant r.f. values were obtained in the 200-ohm units in any wattage range. I do not know why this particular value is more predictable in the megacycle region; it merely is. The resistance is fairly close to the d.c. value, with little reactance, near 3.5 megacycles; but inductive effects and a rising resistance appear by the time 7 Mc. is reached.

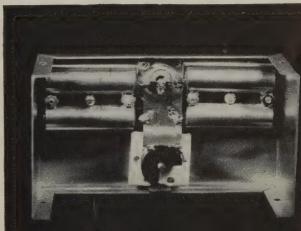
<sup>2</sup> "Adjustable Dummy Antennas," QST, March, 1951.

Wide-Band Compensation of Inductance

The resistors were measured on a Boontoon RX Meter giving r.f. readings of parallel resistance and capacitance. (If an item was inductive, capacitance was added; if capacitive, capacitance was subtracted.) It was early observed that the necessary added capacitance stayed quite constant to 14 Mc. and only dropped moderately going to 30 Mc. Resistance rose somewhat, but not enough to be seriously objectionable in terms of s.w.r. A mathematical cause was found for this action (see Appendix) and it was found experimentally that a fixed parallel capacitor could do a fine job of compensation through 30 and perhaps 60 Mc., depending on the dummy requirements.

The rising resistance characteristics were also put to work. All experimental investigation was aimed at a 50-ohm dummy made from 200-ohm 10-watt noninductive Koolohms, so since the resistance rose approximately 50 per cent at 50 Mc., six resistors instead of four were paralleled, resulting in an effective dummy between 30 and 80 Mc.





At this point, Sprague Products Company President Harry Kalker became interested in the project and had some special resistor-twinholders made for the resistors.<sup>3</sup> The holder capacitance with one end of the resistor grounded was just sufficient to make the resistor bank of six become fairly well compensated from 30 to 80 megacycles. At lower frequencies, the bank of four was equally well compensated.

Going much above 70 Mc., the resistors began to look capacitive, so a series inductance in the form of a hairpin was added. This cancelled much or all of the capacitive effect and permitted use of a shunt capacitor at the terminals to cancel the inductive effect and step up the apparent resistance. Actually all that is being done in this form of the dummy and the other dummies is to find the effect of frequency on the resistor and then find some simple way of correcting for it. There's no magic involved — just a process of measuring, figuring, and trying. Fortunately, the results seem reproducible and the designs may be duplicated without further thinking.

#### Construction and Results

The first thought was that the dummy resistors had to be able to dissipate safely a reasonable amount of power. Power is generally an average effect over a brief period of time, for it takes time for any object to heat to the danger point. The Koolohm construction is good under overload and these resistors may be run for thirty-second periods at twice rated power without damage if they are allowed to cool to room temperature before further use. (It should be stated that

"Koolohm" is a trademark and that the resistors generate the same number of heat calories as any other resistor at the same power.) The power rating for each resistor, therefore, is ten watts continuous and twenty watts for thirty-second periods. Thus a bank of four would have a rating of 40 watts continuous and 80 watts for 30 seconds. Higher powers could probably be used for briefer periods, but there is no data on this. The metal resistor clamps are not believed able to increase power ratings, for what is gained in heat dissipation is considered lost by having other resistors close by.

Capacitors used in compensation are required to carry fairly high currents at the higher frequencies. While many excellent fixed capacitors are made, their "special order" nature and resulting high cost made use of a variable air capacitor desirable. The Hammarlund HF-50 was chosen as being generally available at reasonable cost.

To be widely useful, a dummy should be shielded. No really good shield boxes seem generally available, so the Bud 3006 Minibox was chosen as it had enough volume to permit easy layout and was small enough to be wrapped in aluminum foil when additional shielding was necessary. Extra screws were added to some of the dummies to improve shielding but were inadequate for really critical use such as TVI testing.

Last, but very important, is the type of wiring used. Generally, sheet copper was used to make connections because wide conductors have much less inductance than round wires. The sheet conductor has another useful characteristic: an amazing percentage of the resistor heat can leave by way of the leads, and if the resistors are

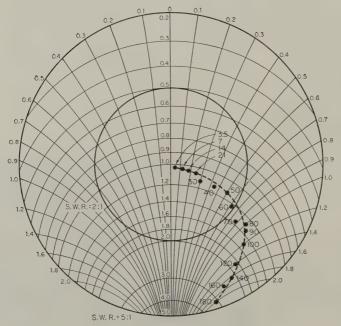


Fig. 3—Impedance characteristics of a Sprague 200-ohm 10-watt noninductive resistor parallel with and ½ inch from a ground plane, with ¼-inch leads and one end grounded. Values normalized to 200 ohms.

20 QST for

<sup>&</sup>lt;sup>3</sup> It is not known at this time whether these will be sold, but they can be duplicated electrically by wrapping all but one end of each resistor in aluminum foil.

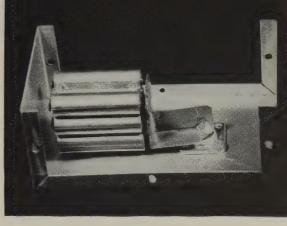
Fig. 4—Thirty to 80 Mc. 50-ohm dummy resistor. Note the use of six paralleled 200-ohm (nominal value) resistors to obtain 50 ohms.

connected by very short leads to a large 'area of copper they operate much cooler.

The first dummy built was intended to cover the range from d.c. to 30 Mc., and the happy results obtained are plotted on the impedance chart of Fig. 1, where the results are expressed as fractions of the desired 50 ohms. Layout seems uncritical, for a later dummy (Fig. 2) with a different layout duplicated these results even to the readings of the compensation capacitor. Incidentally, each of the points under 30 Mc. may be perfectly compensated for reactance by resetting the compensation capacitor.

A fuller understanding of the characteristics of the resistor alone is necessary when aiming at higher frequencies. Measurements without a shield are presented in Fig. 3. This result was obtained with a single resistor tested with one end grounded and the body mounted about ½ inch from a grounded sheet of metal, lead length being about ¼ inch. Here it is apparent that the resistor appears inductive, with increasing resistance to the upper limit of measurement.

As earlier hinted, the easiest way to compensate for the rising resistance is to pretend that it is not there by paralleling larger numbers of the resistors. Thus, in the dummy of Fig. 4, six resistors are paralleled (instead of four) to give a "50"-ohm resistance in the vicinity of 50 Mc. The capacitance supplied by the resistor holders (or foil wraps if the holders are not available) does a quite acceptable job of reactance



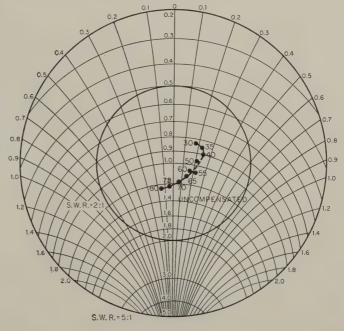
cancellation (Fig. 5), although if perfect reactance cancellation is required, the values shown in the table accompanying the figure may be used.

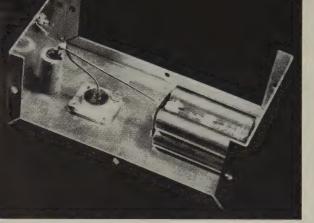
Aiming at still higher frequencies (100 to 180 megacycles), extremely high resistances must be transformed down to the vicinity of 50 ohms. While impedance matching networks may be used having lumped capacitors and inductors, an attempt was made to see whether good compensation could be obtained with just a piece of wire used as a transmission line (Fig. 6). The characteristics resulting are such that, without further compensation, an acceptable dummy is produced between 100 and 135 megacycles (Fig. 7). Added capacitive compensation will take care of frequencies to 170 megacycles.

The use of capacitive compensation may strike some readers as being either cumbersome or expensive. Actually, capacitors are probably the least expensive and most predictable adjustable energy storage devices. The use of shunt capacitive compensation as advocated in this article

Fig. 5—Impedance characteristic of the 30–80 Mc. 50-ohm dummy without further compensation. The shunt capacitance required for complete cancellation of the reactive component of the impedance is as follows:

impedance is as follows:					
Frequency, Mc.	Capacitance, $\mu\mu$ f.				
30	27.9				
35	26.5				
40	21,1				
50	13.8				
55	10.8				
60	6.4				
65	5.3				
70	2.7				





permits use of a grounded-rotor capacitor such as the common variable, with attendant ease of mounting and freedom from hand-capacity effects. Small capacitors should be used, naturally, for large capacitors do have a tendency to look like transmission lines at high frequencies.

#### Composite Resistors

Composition resistors as well as wire-wound types were investigated in the search for a good dummy. The major drawbacks of the type commonly available are inability to handle high power and, particularly in the high-resistance ranges, decreasing resistance and an increasing capacitive reactance.

Plotting the radio-frequency characteristics of these resistors in the fashion of the dummies, it became apparent that over a very wide frequency range composition resistors exhibited almost exactly opposite variations to the noninductive wire-wound variety. The obvious step was to parallel composition and wire-wound resistors.

Fig. 6—Dummy for use between 110 and 170 megacycles. Note the "hairpin" of wire that provides impedance transformation of actual resistance to a value nearer 50 ohms.

This was initially done with a single 200-ohm 10-watt noninductive wire-wound resistor and five 1000-ohm 2-watt composition resistors to make a 100-ohm nominal 20-watt resistor. The composite resistor still exhibited a small amount of inductance at thirty megacycles, but this was easily compensated by the addition of 1.1  $\mu\mu$ f. in parallel in the form of two small series NP0 ceramic capacitors.

The final form of the composite dummy was a 50-ohm 40-watt unit (Fig. 8) constructed in the standard case selected for this series of dummies. Good characteristics resulted (Fig. 9) although it should be emphasized that composition resistors are sensitive to power overloads, so such a combination should not be run at more than half of the total wattage if close long-term stability is desired. If less than the best stability is satisfactory, full rated power may be run for fifteen seconds or so at frequencies under 30 megacycles.

#### Use of Dummy Resistors in the Ham Station

Most hams wrongly think of a dummy as a seldom-used device whose only purpose is to burn up unwanted power. Instead, dummy resistors, dollar for dollar, are probably among the most useful station accessories, next to a monitor and s,w,r, bridge.

Dummies should be used to check a transmitter before putting it on the air. This is commonly done by connecting to the transmitter a dummy whose impedance is near the actual antenna or

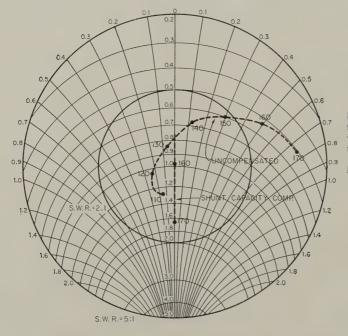


Fig. 7—Impedance characteristics of the 110–170 Mc. 50-ohm dummy, with and without capacitive compensation. Required values of compensating capacitances are as follows:

capacitances	are as follows:
Frequency, Mc.	Capacitance, $\mu\mu$
140	5.4
150	14.3
160	19.0
1 <i>7</i> 0	1 <i>7.</i> 1

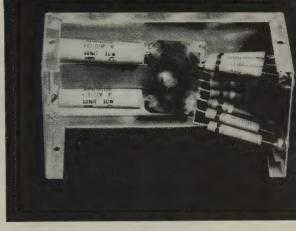
ιf.

Fig. 8—Composite 50-ohm dummy made up of two 200-ohm 10-watt noninductive wire-wound resistors and ten 1000-ohm 2-watt composition resistors. The tongue between the wire-wound resistors may be bent to furnish capacitive compensation. The coaxial connector is under the copper sheet.

transmission line input impedance. In the 'case of first-time operation of a transmitter, this is obviously necessary to prevent an unexpected load from resulting in damage to the equipment. The average amateur should use this dummy to peak up each transmitter stage at an operating frequency before attempting transmission, as well as for experimentation. Those with small children will also find it useful to reset disturbed dials correctly when curious fingers have "worked with radio like Daddy." In any case, the law requires (Section 12.151) that ". . . each amateur station shall be operated with good engineering and good amateur practice," and good engineering practice prohibits putting an unnecessary signal on the air.

TVI investigation requires the use of a dummy antenna that is well shielded, for harmonics leaking out of a poorly shielded dummy can cause TVI as easily as harmonics leaking out of a poorly shielded transmitter. Any of the dummies described in this article if well wrapped in aluminum foil are as tight to r.f. as the best transmitters can be expected to be. If such a dummy is used for the transmitter load and TVI persists, interference power is leaking through the transmitter case or coming out on key, mike, or power leads.

Coaxial cable is often suspected of breaks when used to feed an antenna that loads poorly. A dummy placed at the far end of the cable will show a low s.w.r. and normal loading on a good



piece of cable, while either open or shorted cable will have a high standing-wave ratio.

Antenna s.w.r. bridges are readily cheeked with dummy resistors. Frequently an antenna bridge (being a new and expensive piece of station equipment) is first suspected when an unusual loading condition is encountered. Use of a dummy load instead of an antenna rapidly answers the question, for a bridge showing a low s.w.r. on the dummy is good and the trouble is elsewhere.

Summing up, a dummy will not necessarily produce a better or stronger signal, but it will make attaining a good strong signal a quick, easy and legal job.

#### Acknowledgments

This work was done while the writer was an employee of Sprague Electric Company and their assistance and that of Sprague Products Company is acknowledged and appreciated.

(Appendix on page 180)

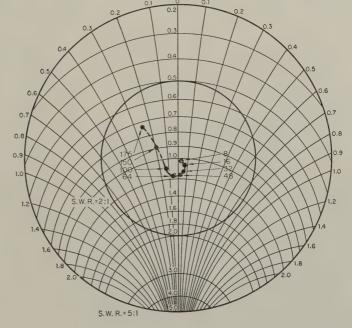


Fig. 9—Impedance characteristics of the composite 50-ohm dummy resistor pictured in Fig. 8. Wide-band characteristics of this dummy permit its use from zero to 175 Mc. in most applications, though care must be taken to avoid overload.



An input of about 10 watts can be run to this compact mobile rig on 80 or 40 meters. Along the bottom of the panel are the resonance-indicator lamp, change-over switch, tune switch and microphone jack. Above are controls for the tank and loading capacitors.

## Two-Tube Mobile Transmitter

Simple Job for 80 or 40

BY M. J. WESTREM, \* WOHOB

Although this transmitter contains only two tubes, it is a complete mobile transmitter, including the modulator. Power input to the final runs about 10 watts. The transmitter is designed to use the B+ voltage from the car's receiver. It can be built with a minimum outlay of money, time, and effort. Its small size greatly simplifies installation problems. As for performance, reports received have been very complimentary, and gratifying. The stations worked report that audio quality is excellent.

#### Circuit

The circuit of the transmitter is shown in Fig. 1. One half of a 12AT7,  $V_{1A}$ , is used in a Pierce oscillator circuit. The plate of the oscillator uses a 15,000-ohm load resistor instead of the usual r.f. choke, as it was found that sufficient drive was obtained.

The oscillator is capacitively coupled to the 6CL6. The output tank circuit is of the pi-net type, to assure tight coupling to the antenna. With the type of modulation used in this transmitter, it is necessary that the transmitter be heavily loaded to maintain good audio quality.

The other half of the 12AT7 is used as a screen modulator. In this circuit, the plate is grounded \*Garner, Iowa.

Here's a little mobile rig that you can operate from your car radio's power pack. It costs but a few dollars and can be put together over a week end.

for audio, but it is not a cathode follower since the input signal is applied from grid to cathode, not grid to ground. The carbon microphone obtains its voltage from the car battery. The battery and resistor  $R_1$  are bypassed for audio by the 100- $\mu$ f. capacitor  $C_6$ . The microphone is coupled through a microphone transformer to the grid of the 12AT7. The 330-ohm resistor in the cathode circuit is to obtain the required bias on the modulator, and apply the proper screen voltage to the 6CL6. (The modulator plate and the amplifier screen are in series for d.c. and the screen voltage depends upon the d.c. drop across the modulator tube.) This resistor is by-passed for audio by the 10-μf. capacitor. No modulation control is provided; if one is desired, a 250-ohm variable resistor could be substituted for  $R_1$ .

One pole  $(S_{2A})$  of a d.p.d.t. switch is wired so that in the tune position (switch closed) the normal operating voltage is applied to the screen of the 6CL6. The other pole  $(S_{2B})$  couples the tuning indicating lamp  $I_1$  into the circuit. A s.p.s.t. switch may be used, and the indicating lamp left wired in the circuit permanently. The tuning lamp was used in place of a milliammeter because when the transmitter is tightly coupled to the antenna, the dip at resonance becomes very slight and it is difficult to tell when the final is resonated. The tuning lamp gives a better indication of resonance, is much more economical, and requires less space on the front panel.

The relay  $K_1$  switches the antenna from the transmitter to the receiver. It also switches the B+ voltage from the transmitter to the receiver. Fig. 1 shows filament connections for both 6- and 12-volt systems.

If your car is one of the newer ones that has a radio with no high-voltage supply, any power supply that is capable of delivering between 200 and 300 volts at 90 ma. will work.

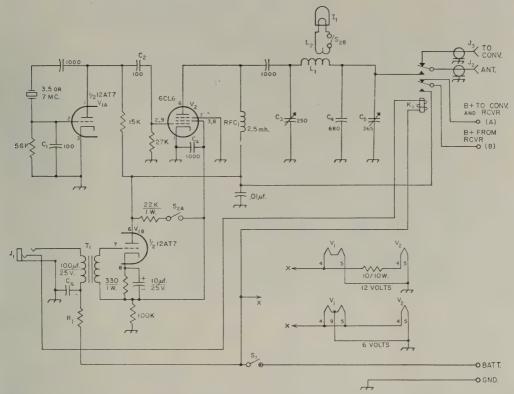


Fig. 1—Circuit diagram of the two-tube mobile transmitter. Unless otherwise indicated, capacitances are in  $\mu\mu f$ , capacitors marked with polarity are electrolytic,  $C_1$ ,  $C_2$  and  $C_4$  should be mica or low temperature-coefficient ceramic; other fixed capacitors may be disk ceramic; resistors are  $\frac{1}{2}$  watt and resistances are in ohms.

C1, C2, C4—See above.

 $C_3$ —225- to 250- $\mu\mu$ f. variable (Bud Mc-1859 or equiv.).

C<sub>5</sub>—Broadcast replacement variable.

C6—Electrolytic—If battery positive is grounded, negative terminal of C6 should go toward R1; if battery negative is grounded, positive terminal of C6 should go toward R1.

I<sub>1</sub>-60-ma, dial lamp.

 $J_1$ —Double-circuit microphone jack.

J<sub>2</sub>, J<sub>3</sub>—B.c. antenna connector.

 $K_1$ —6- or 12-volt d.p.d.t. miniature relay, depending on battery voltage.

L<sub>1</sub>—32 turns No. 20, 1-inch diam., 2 inches long (B & W 3015 Miniductor or Air Dux 816).

 $L_2-1$  turn insulated wire around  $L_1$ .

R<sub>1</sub>—50 ohms 1 watt for 6-volt systems; 150 ohms 1 watt for 12-volt systems.

RFC<sub>1</sub>—National R-100 or similar.

S<sub>1</sub>—S.p.s.t. toggle switch.

S2-D.p.s.t. toggle switch.

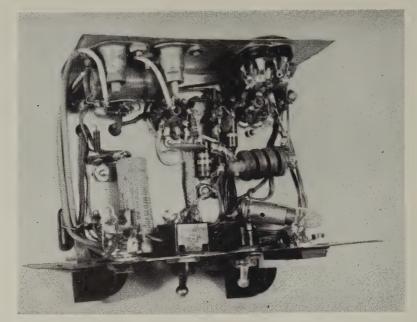
T<sub>1</sub>—Single-button carbon microphone transformer.

 $V_1 - 12AT7.$ 

V<sub>2</sub>—6CL6.

The pi-network tank coil is suspended, by its leads, between the input and output capacitors, and above the antenna relay. At the rear of the chassis are the microphone transformer, 12AT7 and 6CL6. Connections to antenna, converter input, and power supply are made via the jacks on the rear apron of the chassis.





Bottom view showing control switches, resonance indicator lamp, and other small components.

#### Construction

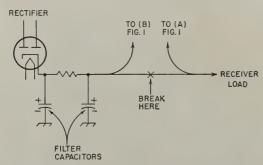
Layout of the major components can be seen from the photos. The complete transmitter is housed in a  $5 \times 6 \times 4$ -inch utility cabinet. The tuning-indicator lamp is mounted under the chassis, behind the panel, in such a position that it shines through the jewel mounted in the panel.

The parts mounted on top of the chassis are the relay, microphone transformer, tubes, final tank coil, and the tuning and loading capacitors.

Ordinary car-radio antenna connectors were used as input and output connectors. Short pieces of coax cable are used between the relay and these connectors.

A 6-prong tube socket is mounted on the back for making the necessary connections to the receiver. Only 4 of these pins were used, so a 4-pin socket could be substituted.

The power supply of the receiver will have to have some slight modification, as shown in Fig. 2. This consists of removing the B+ lead from its



Fia. 2—Diagram showing alterations in car-receiver power-supply wiring.

load in the receiver, and bringing both the B+lead and the load connections out.

#### Tuning

The coil data given here is for the 75-meter band; however, this transmitter can be used on 40 meters merely by using a 40-meter crystal, and changing the final tank circuit to 40 meters.

To place the transmitter in operation, insert a crystal of the desired frequency in the crystal socket, turn on the transmitter, and allow it to warm up. Turn the TUNE-OPERATE switch to the TUNE position. Adjust the loading capacitor to maximum capacitance (plates fully meshed). Next, key the transmitter with the push-to-talk switch on the microphone, and adjust the tuning capacitor until the tuning-indicator lamp lights the brightest. Open the loading capacitor a little at a time while continuing to keep the final resonated with the tuning capacitor. It will be noted that as the loading increases, the brilliance of the lamp diminishes. Continue to increase the loading until a point is reached where any further loading has no effect on the brilliance of the lamp. Once you become accustomed to loading a transmitter with this type of indicator, it is guite easy. Whenever you change frequency, be sure to reload the final because, as stated earlier, the audio quality will suffer if the transmitter is not properly loaded.

Although no attempt has been made to operate this transmitter on the higher-frequency bands, it is felt that this could be done easily by using oscillator circuits designed for harmonic operation, and changing the final tank circuit to the band desired. Information on these circuits can be found in *The Radio Amateur's Handbook*.

### A Simple Quad Antenna Support

#### Available Materials and Bolt-On Construction

BY JACK G. HOLLENBECK,\* W6JIC

The electrical design of a beam is important, of course, but if you want the beam to stand up over a period of time you have to give considerable thought to the mechanical details. In this article W6JIC describes a logical Quad support that can be constructed with a minimum of tools.

AFTER a lot of thought, reading, looking and planning, I decided to build a beam. It had to be strong, durable and inexpensive. It couldn't have the wing span of a full-sized 20-meter beam, but the prospect of one of the shortened beams left me dissatisfied. And, to top it off, I'm one of those fellows who wants a thing to work without too much fuss or continual adjustment.

With a list of requirements like that, and from rag chews and reading the mail, I decided upon a cubical Quad antenna. The only complaints I ran into about this type of antenna were not about the antenna proper but about the failure of the element supports to maintain alignment and to stand up under severe conditions.

Bamboo fishing poles, a commonly used support, just didn't appeal to me. In this area they cost more than other materials, and the sun and

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Fig. 1—Details of the Quad antenna mount (one element). Two 4-foot lengths of 1 × 1-inch angle are bolted on opposite sides of the 8 × 8-inch plate. These angles each support two lengths of ½-inch EMT, and the final extensions (and antenna insulators) are lengths of ½-inch varnished hardwood dowel.

5/8-INCH DOWEL

10-FOOT LENGTH 1/2-INCH EMT

4-FOOT LENGTH 1×1×1/8
ALUMINUM ANGLE

8×8×1/8-INCH
ALUMINUM
ALUMINUM

5/8-INCH DOWEL

10-FOOT LENGTH
1/2-INCH EMT

weather will cause them to crack and collapse. Unless special precautions are taken, their natural tendency to bend over a period of time will cause a change in spacing and alignment.

The strongest (and cheapest) element support material I could find was electrical metallic tubing, known in the trade as thin-wall conduit or EMT. The only apparent drawback was the fact that it comes only in 10-foot lengths and, while this poses no problem on 10 and 15 meters, the diagonal for a 20-meter Quad runs about 25 feet. Some method had to be found to stretch the EMT a few feet. Telescoping was out of the question, since the various sizes of EMT do not telescope without using special bushings. I decided to "borrow" a little at the support and make up the rest by using hardwood dowels as extensions at the ends. By varnishing the dowels, they could double as insulators.

The final design, shown in Fig. 1, involves only sawing and drilling operations, and the usual "visit your local machine shop" instructions are not required. The entire assembly is bolted together, and just the ordinary wrenches and screwdrivers are needed for the assembly operations. If you're worried about fitting a ½-inch diameter dowel into a piece of ½-inch EMT, forget it; "½ inch EMT" has an i.d. of just under 5% inch. A length of dowel was used between each pair of EMT sections to keep the EMT from collapsing when the bolts were tightened. The end dowel sections are held in place by several cadmiumplated 3%-inch No. 4 sheet metal screws.

Although the galvanized finish on EMT is very good, I used a coat of red oxide primer and two coats of good aluminum paint to protect against rust at the points where the EMT had been

drilled and wherever steel hardware had been used.

The boom can be made of large (1½ or 2-inch EMT), provided a section is welded to it to give the proper length for 20 meters. EMT is readily available at most hardware and electrical wholesale houses, and it is very easy to handle. The usual hand tools found in most workshops will more than do the job.

(Dope on Quad dimensions and other particulars not discussed here can be found in the following QST references: "Technical Correspondence," June, 1958; "Technical Correspondence," April, 1958; Hall, July, 1957; Leslie, January, 1955.—Ed.)

## Working Ionospheric Scatter on 50 Mc.

#### DX When the Band Is Dead

BY JOE TAYLOR, JR.,\* K2ITP

YAY, just how does one work that ionospheric scatter?" In past months the writer has been asked this question often. Many v.h.f. hams have read something about ionospheric scatter, and developed an interest in it, but have never really given it a try. They wonder if one must have a kilowatt to get into the game, or if a hundred watts will work. They wonder if one can use medium speed c.w., or even phone, or if scatter is strictly a 35-w.p.m. c.w. man's game. This article was written to answer some of these questions, and to try to get more v.h.f. men active in this intriguing phase of 50-Mc. communication. Picking up a new state or two, gathering a few extra section multipliers in a QSO Party to beat out the local competition, or just the thrill of working DX under normal conditions — these should be enough to give many v.h.f. men the urge to try scatter work on 6.

It might be well to begin with a few definitions. The terms meteor scatter and ionospheric scatter, often used interchangeably, do not mean the same thing. Meteor propagation is the bursttype of communication which avid two-meter men use to work new states during meteor showers. This type of signal is reflected from one specific spot in the ionosphere for each "burst," i.e., the ionized meteor trail, (See Fig. 1.) This phenomenon is similar to sporadic-E reflection, except that the reflecting medium is rapidly appearing and disappearing meteor trails, instead of a more permanent ionized cloud. If the meteor trail is ionized sufficiently to reflect the signal at the required angle, the received signal, in all likelihood, will not be very weak. It may not last too long, but even with less than 100 watts, the signals often reach S9 on 50 Mc., and 144-Mc. pings and bursts may be many decibels above the receiver noise.1

On the other hand, true ionospheric scatter signals are not reflected from any specific spot — they are truly scattered. (See Fig. 2.) Multiple reception paths exist frequently, causing signal levels to vary tremendously, with fast, fluttery

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QSB. These are the signals that are there when high power and good antennas are used, regardless of weather, solar, or meteor-shower conditions,

#### What Kind of Equipment?

You can work meteor skip on 50 Mc. with 50 watts — and don't let anyone tell you otherwise! The writer has had many meteor QSOs using approximately this power, especially during the better showers. The more power you can put on, the more consistent your scatter QSOs will be. It is unlikely that powers under several hundred watts will produce the "background signal" of true ionospheric scatter, but if you rely on meteor propagation only (i.e., signal audible only on bursts), much lower power may be used.

In any event, the signal should be clean. This means no drift, no chirp, and no frequency modulation. Don't settle for anything less than a true T9X! Be sure to check your keying for clicks; bad key clicks can be as hard on your neighbors as overmodulation splatter. But don't make the keying too soft, either. The received signal will sound soft, anyway, because of the flutter. And remember, the lower your e.r.p., the more attention you must pay to these details. It is surprising what you can do with a clean 100 watts of r.f.

Reception of weak signals on 50 Mc. does not require a converter with an extremely low noise figure. Man-made noise is the limiting factor in urban areas most of the time. Even if a location is free of man-made noise, random "antenna noise" will be audible without going lower than about 5 or 6 db. in noise figure. There is only one way to make sure that your converter is good enough for your location: at a quiet time of day, disconnect the antenna from the converter and replace it with a carbon resistor equal to the line impedance. If the noise level is noticeably higher with the antenna than with the dummy load, then your converter passes the test. At the writer's location, which is not a particularly noisy one, 2 to 3 db. of antenna noise can be heard with a single 6AK5 r.f. stage in the converter. Lower noise figure would not help, and more gain would only make it easier to overload the mixer.

The receiver following the converter does not have to be in the 75A-4 class. It should have

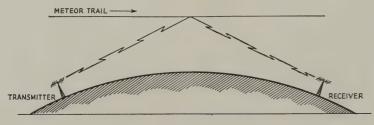


Fig. 1—Meteor burst signals are similar to sporadic-E skip in propagation path, but they last only as long as the trail is sufficiently ionized, usually not more than 20 seconds or so. Even low power may produce readable signals at the peak of the reflection.

 $<sup>^1</sup>$  For a detailed description of meteor propagation, and a calendar of Meteor Shower Data, see Bain, "V.H.F. Meteor Scatter Propagation,"  $QST, {\rm April}, 1957.$  Ionospheric scatter fundamentals were discussed by Moynahan in QST for March, 1956.

good stability, and have a crystal filter, Q multiplier, or other means of obtaining fairly good selectivity. Restriction of the audio bandwidth is also helpful.<sup>2</sup>

The answer to the question of antenna size is similar to that of power level — the larger, the better — but you can get away with using something less than the best. From the writer's experience and correspondence it appears that long Yagis and stacked arrays with similar forward gains yield similar results on scatter. We don't want to start any arguments; you can believe this or not, as you wish. Just remember, you can't make them too big.

Remember, too, that although you don't need a full kilowatt, and you don't need the world's best receiver, and you don't need to have stacked long Yagis, if you compromise in too many places simultaneously you may compromise yourself right out of the scatter picture!

#### How To Communicate?

The actual method of exchanging information with the other station depends largely upon the power used and upon personal preference. As implied earlier, you won't get much of a true scatter background signal with powers under 300 watts or so. Therefore, if you run less than this, you should make your plans so as to make the best use of meteor bursts. This means that you want to get as much information as possible across in a short time. Consequently, mediumor high-speed c.w. will certainly help.

Low Power - You won't get much in the way of results by firing up your 100 watts and 4-element beam and calling CQ DX when the band is dead. Your best bet is to write to a 50-Mc. man in the area you want to work into, who you know is active on c.w. Set up a definite schedule with him, and use timed transmissions of one minute each way, or whatever you prefer. Be sure that you can spot each other's frequencies closely, for you won't want to waste any time tuning around. To make the best of short bursts, use keying speeds of 15-25 w.p.m., if you can. You will have to repeat plenty. Something like "WØXXX de K2ITP SNJ SNJ" repeated over and over has worked wonderfully for the author in QSO Parties. Even with low power, sooner or later (usually within 10-20 minutes) there will be a

Fig. 2—If enough power is used a signal of readable strength is scattered from the ionosphere. Multiple reception paths are frequently apparent, causing rapid fading. Since the irregularities in the ionosphere that cause the scattering are always present, a consistent though weak signal is always available.

good burst, and your message will be copied. Repeat the process to get your "R's" across, and you've got a new section multiplier, or state, etc. It won't be the quickest QSO in the contest, but if it puts you one section multiplier up on the local competition it will be worth the time spent.

High Power — Suppose, on the other hand, that you're running upwards of a half gallon, and have stacked antennas or a long Yagi. Then you should have a bit of that consistent, fluttery background signal. Keying speeds will not be so important. At times 10 w.p.m. may be more copiable than 25 or 30, for it may not be "chopped up" as badly by the fast QSB. This, however, depends a great deal upon individual operators.

Timed transmissions will still be helpful, although if you find that your signals are audible most of the time, you can be much more lenient about the timing. The other guy will know when you sign, anyway.

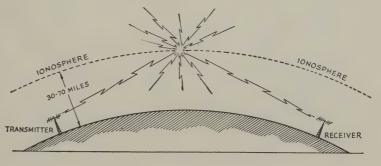
You'll still need to repeat a good bit, unless you're better than the writer at copying fluttery signals. But now you have the satisfaction of knowing that you have set up a really consistent path for QSOs, regardless of band conditions for other types of propagation!

Voice and Scatter—It's a lot harder than using c.w., but you can use voice on 50 Mc. scatter. Quite a few phone QSOs have been made during the better meteor showers between stations running fairly high power. One good system is to repeat each sentence three times; with a little luck, fairly solid contacts may be made.

Getting rid of the carrier and one of the side bands helps a great deal. The writer recently made a series of weekly s.s.b. tests with W4IKK and W4RMU, in addition to our regular c.w. schedules. These tests were made in non-shower periods, when the band was dead. Power was 500 watts indicated d.c. input on s.s.b., and 700 watts on c.w. The s.s.b. was not copiable for the percentage of the time that the c.w. was, but plenty of calls, signal reports, "Good mornings," etc., were copied on s.s.b.

#### Conclusion

So, let's get out the key, write some letters, and give this 50-Mc. ionospheric scatter a try. Even if you aren't a contest man, and already have all the states within 1200 miles, it can be a lot of fun. This business of working 600–1200 miles without waiting for the band to open bears looking into, and you can do it!



<sup>&</sup>lt;sup>2</sup> O'Hern, "Simple Low-Pass Filter Design," *QST*, October, 1957.

## New Thresholds in V.H.F. and U.H.F. Reception The World Below KTB

BY ROSS BATEMAN\*, W4AO AND WALTER F. BAIN \*\*, W4LTU

Ever since the first ham twiddled with the first coherer, we have been trying to improve our receivers. Now, with the coming of the maser and reactance amplifier, there appears to be a possibility of an improvement, and in an area where it will do the most good: the frequencies above 100 Mc. In a later article, we will discuss the details of these devices, but now let us back up a bit and consider just what limitations exist in the detection of weak signals and what these devices will buy us. Some of the factors involved are not readily apparent.

Most of us are familiar with the idea of noise figure, as simply a measure of how much worse our receiver is than the ideal receiver. The ideal receiver, in turn, is a device which adds no noise to that fed into it by the antenna.

Noise figure as measured on a noise generator has usually been a criterion of receiving performance, so let's start with it. Such a measurement has just been made and found to be quite good. We are now ready to go on the air so the receiver is connected to the antenna. If everything is matched, there is no reason to believe that the receiver noise figure is now any different, and it isn't. Now assume that the antenna is putting out vast amounts of noise which add to the receiver noise. Obviously, our ability to receive weak signals has suffered, but the noise figure remains the same. What, then, is the paradox? There is none. Noise figure, as considered above, is a measure of the receiver alone.

Apparently, then, noise figure as normally measured does not tell the whole story. To know where we stand, include the effects of the antenna and think in terms of an over-all or effective noise figure. Taking the liberty of one little equation, the relation of a new over-all noise figure, Fo, to

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Most amateurs are aware that spectacular advances are being made in r.f. amplifier design that promise markedly improved reception throughout the v.h.f. and u.h.f. portions of the spectrum. Here two well-known v.h.f. men who have been active in the development of the reactance amplifier show why the lower noise figures now being achieved are of such importance. A future article will deal with the practical aspects of the new amplifier techniques.

the easily measured receiver noise figure,  $F_{\rm R}$ , is readily seen:

$$F_{\rm O} = (F_{\rm R} - 1) + N_{\rm A}$$
due to due to receiver antenna

Note that the contribution from the receiver now appears as receiver noise figure minus 1. This unit of 1 was subtracted because it is not part of the actual receiver contribution, but simply the standard of comparison by which the receiver was gauged. It happens to be the thermal noise of the terminating resistor in the noise generator. The equation may be developed by starting with the receiver connected to the noise generator and measuring  $F_{\rm R}$ . With the noise generator termination, the effective noise figure,  $\overline{F}_{O}$ , is simply  $F_{R}$ . Now switch the receiver from the generator to the antenna, losing the one unit of noise caused by the termination and adding in its place antenna noise,  $N_A$ . Hence,  $F_O$  is now equal to  $(F_{\mathbf{R}} - 1) + N_{\mathbf{A}}$ . Note that in the above equation if the antenna noise is equal to one, we are back where we started and the over-all noise figure is equal to receiver noise figure.

However, in the more likely event that  $N_A$  is different than one, the over-all noise figure can be either greater than or less than the receiver noise figure. In fact, the *over-all* noise figure can even be less than one (negative db.'s), something not possible for receiver noise figure, which by definition includes one rather arbitrary unit of room temperature thermal noise. Thus, if antenna noise is much larger than the receiver noise, obviously we are stuck with it and little over-all improvement can be had by improving the receiver noise figure. For example, with a decent antenna, at 3.5 Mc., it doesn't matter much if the receiver has a 3-db. noise figure or a 6-db. noise figure. Atmospheric noise is so great that doubling the noise generated in the receiver is like adding two watts of additional power to a 500-watt transmitter instead of adding one watt. Your DX contact will never know the difference.

On the other hand, as will be seen, if antenna noise is much less than receiver noise, we really have something to gain by improvements in the front end. A 3-db. improvement in front-end noise figure can result in more than a 3-db. overall improvement. Suppose that you have a receiver with a noise figure,  $F_{\rm R}$ , of 2.5 (4 db.), and that antenna noise,  $N_{\rm A}$ , is equal to 0.25. The over-all or effective noise figure is 2.5 - 1 + 0.25 = 1.75 (2.4 db.). If the receiver noise figure is now reduced by 3 db. to 1.25 (1 db.), the effective noise figure becomes 0.5 (-3 db.), a net improvement of 5.4 db. This all seems to prove that sometimes a db. is not a db.

Since antenna noise is a vital factor in the problem, it is worthwhile to take a look at what causes it and what control, if any, we have over it. Antenna noise may be visualized to be thermal noise in a resistance, the radiation resistance of the antenna in question. Its magnitude is dependent not on the temperature of the physical structure of the antenna, but rather on the effective temperature of whatever the antenna is looking at. (Effective temperature is the product of the actual temperature and a radiation coupling factor.) Thus, the antenna may be considered to be nothing more than a thermometer whose output (noise) is proportional to its "temperature." When such an antenna looks at the open sky above 20 Mc.; we find that it registers an output corresponding to considerable temperature, depending on the direction and frequency in use. This is known as cosmic noise 1 and is the basis of radio astronomy. Fairly complete maps, plotted as power or temperature, have been made of this radiation from the sky, and it is of interest to note that they bear little relation to what we see in the sky visibly.

How intense is this radiation, and how does it vary with frequency? Fig. 1 shows a plot against frequency of the average cosmic noise level (average of all directions) and it can be seen that it is quite high in the h.f. region, has dropped to be equal to room temperature thermal (KTB) at about 175 Mc., and drops to quite low values at u.h.f. For convenience, figures are given in decibels, while the equation was in

terms of power ratios.

It is of interest also to see how this noise varies across different portions of the sky at a given frequency. Fig. 2 shows a plot of the received noise that would be obtained at 144 Mc. with an antenna of  $18^{\circ}$  beamwidth scanning across the sky at a declination of  $-30^{\circ}$ . (Declination is simply celestial latitude.) This particular sector gives a higher average than the entire sky, but was

<sup>&</sup>lt;sup>1</sup> Below about 20 Mc., antenna noise does not consist exclusively of cosmic noise, but is largely caused by such unexotic sources as atmospherics, neon signs, electrical appliances, etc.

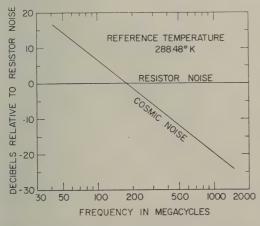


Fig. 1—Average cosmic noise variations with frequency.

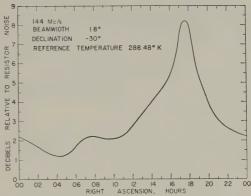


Fig. 2—Example of cosmic noise variation across the southern sky.

chosen to show that large variations in level are possible. It would not be necessary to rotate the antenna to obtain this curve, but rather the antenna could be fixed and readings taken over 24 hours while the earth rotates. This curve points up the importance of pointing toward the cold portions of the sky on frequencies where cosmic

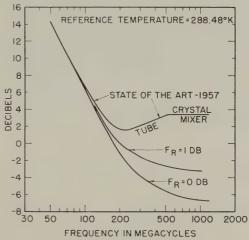


Fig. 3—Over-all effective noise figure for an antenna pointing at the horizon and average cosmic noise.

noise is the limitation, or of waiting until a cold portion is in the direction we wish to work.

We have now seen that overall sensitivity is strongly affected by antenna noise. We have also seen how this antenna noise varies with frequency and antenna direction. Now let us plug in some numbers and see what it all adds up to.

Fig. 3 is a plot of over-all effective noise figure  $(F_{\rm O})$  versus frequency and includes the effect of both the receiver noise figure  $(F_{\rm R})$  and the cosmic noise level (antenna noise),  $N_{\rm A}$ . Three curves are shown, the top one assuming the best available tube noise figures below 500 Mc. (416B), and best crystal noise figures above 500 Mc. The middle curve indicates what may be expected with a 1-db. noise figure across the frequency range, and the lower curve gives the

(Continued on page 216)

## • Technical Topics—

## Input Impedance and Fed-Through Power in Grounded-Grid Amplifiers

Interest in the grounded-grid power amplifier has been high because the circuit offers one way to make use of otherwise-excessive power output from a driver. Another feature is low input impedance and the accompanying possibility of eliminating a tuned driver-coupling circuit. Simple methods of calculating the fed-through power and input impedance are discussed here.

The operation of the grounded-grid amplifier circuit shown in Fig. 1A can be understood without much difficulty by making use of a simple equivalent circuit. The circuit at A is intended merely to be representative (even the d.c. feed arrangements have been omitted); any suitable coupling circuits could be substituted for the tuned circuit,  $L_1C_1$ , by means of which the driving power is applied to the grid-cathode circuit of the tube, and for the parallel-tuned output tank,  $L_2C_2$ . Also, it will be taken for granted in the following discussion that the plate-to-cathode capacitance of the amplifier

tube is so low that no appreciable amount of r.f. energy can be fed through it either from the input side to the output side or in the opposite direction.

In the equivalent circuit at B the driver and coupling circuit  $L_1C_1$  have been replaced by an r.f. generator,  $G_1$ , having an internal resistance  $R_1$ , and developing a voltage  $E_1$  at its output terminals.  $E_1$  is the r.f. voltage applied between grid and cathode in the actual amplifier. The resistance  $R_G$  is present to account for the grid losses in the amplifier under the chosen operating conditions — in other words, with  $E_1$  applied to  $R_G$  the power lost in  $R_G$  is equal to the driving power  $(W_G)$  that would be needed if the tube were being operated in the familiar grounded-cathode circuit.

An equivalent generator,  $G_2$ , having an internal resistance  $R_2$  and generating an r.f. output voltage  $E_2$ , also replaces the amplifier tube of Fig. 1A.  $E_2$  is the r.f. voltage that appears between cathode and plate under the assumed operating conditions. In the third section of the equivalent circuit,  $R_{\rm L}$  replaces the tuned tank circuit.  $R_{\rm L}$  is the load resistance as seen by the amplifier circuit—the transformed (by the tank) value of the actual load resistance. The actual load may be a

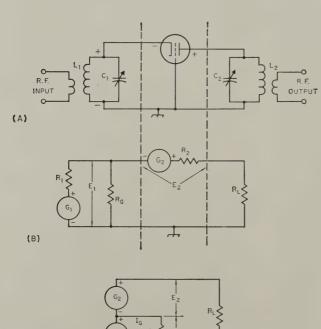


Fig. 1—Equivalent circuit of the groundedgrid amplifier. As shown in the simplified equivalent at C, the driver and amplifier may be considered as two generators in series with the power-consuming load resistance. The voltages of these two generators are in phase, as indicated by the instantaneous polarity signs on the circuits,

(C)

transmission line or any of the devices that commonly absorb or transfer power from transmitting circuits.

 $E_1$  and  $E_2$  are the terminal voltages, rather than the generated voltages, of  $G_1$  and  $G_2$ , respectively. Under a given set of operating conditions they may be considered to be constant. When this is so the generator internal resistances  $R_1$  and  $R_2$  can be ignored. Thus the equivalent circuit can be simplified still further to the one shown at C in Fig. 1.

#### **Equivalent-Circuit Operation**

With this equivalent circuit it is readily possible to calculate both the total power required from the driver and the impedance of the amplifier input circuit as seen from the driver. Fig. 1C is obviously a rather simple Ohm's Law circuit. The power in  $R_{\rm L}$  is supplied by  $G_1$  and  $G_2$  acting in series, thus the total r.f. voltage across  $R_{\rm L}$  is the sum of  $E_1$  and  $E_2$ . Since  $G_1$  and  $G_2$  are in series with  $R_{\rm L}$ , the same r.f. current flows through all three. This current, which we will designate  $I_p$ , can be found from the known power output of the amplifier tube:

$$I_{\rm p} = \frac{W_{\rm p}}{E_2}$$

 $I_{\rm p}$  is the effective value of the fundamental-frequency r.f. current that flows through  $R_{\rm L}$  (not to be confused with d.c. plate current), and  $W_{\rm p}$  is the rated output of the amplifier tube.

The power contributed by the driver to  $R_{\rm L}$  (fed-through power) is

Fed-through power = 
$$E_1I_p$$

The resistance seen by the driver — that is, the input impedance of the amplifier — is simply the driver voltage divided by the total r.m.s. driver current. The total driver current can be found easily, knowing the total driver power and the voltage  $E_1$ . The total driver power is the sum of the fed-through power and the grid losses in the amplifier (the "normal" driving power). Thus the total driver current is

$$I_{\rm p} + I_{\rm G} = \frac{\text{Total driver power}}{E_1}$$

The input impedance of the amplifier is then

$$\frac{E_1}{I_{
m p}+I_{
m G}}$$
 ohms

In most cases,  $W_{\rm G}$  will be fairly small compared with  $E_1I_{\rm P}$ ; that is, considerably more power is fed through to the output circuit than is consumed in the grid circuit of the amplifier tube. For a given set of operating conditions, no more power is actually lost in the grid with grounded-grid operation than with grounded-cathode operation.

#### Fed-Through Power

The amount of fed-through power is controlled by the relationship between the grid-cathode

driving voltage,  $E_1$ , and the tube output voltage,  $E_2$ . The larger the ratio of  $E_1$  to  $E_2$ , the larger the proportion of the total output power that is supplied by the driver.

It follows that a tube requiring a relatively large driving voltage as compared with output voltage — that is, a low- $\mu$  tube, in the case of a triode — will have greater fed-through power than one (high- $\mu$ ) that takes relatively little driving voltage. This assumes that both types operate at the same plate voltage and develop the same output power at the same plate current. It does not mean that the low- $\mu$  tube is "harder to drive" than the other, since both may have the same, or approximately the same, actual loss in the grid.

Also, for a given tube operating at a specified plate voltage, a choice of operating conditions that requires a larger driving voltage will result in a greater amount of fed-through power. If there is no limitation on grid bias the fed-through power can be increased simply by increasing the negative bias and increasing the driving voltage to give the same amplifier plate current. In general, this can be done only in Class C operation since the bias cannot be set beyond cut-off in the Class B amplifier.

In any given setup the amount of fed-through power depends on the actual plate loading as represented by the load resistance  $R_{\rm L}$ . Within the normal limits of operating conditions as determined by, for example, desirable values of amplifier plate efficiency, increasing the loading (by reducing  $R_{\rm L}$ ) will result in more power being fed through, since heavier loading will mean increased  $I_p$ . The converse also applies. The relationship is not linear, however, since the amplifier tube does not generate a constant terminal voltage with varying load resistance; also, the optimum driving voltage depends on the loading so the driving voltage, too, should be changed when the load resistance is changed. Hence calculations are usefully accurate only when a specific set of operating conditions is selected.

#### Input Impedance

To a first approximation (neglecting the effect of grid losses) the amplifier input impedance is equal to  $E_1/I_p$ . Thus it will be larger if  $E_1$  is increased while  $I_p$  is held constant, or will be smaller if  $I_p$  is increased while  $E_1$  is held constant. In a general way, this means that if the plate current of a given amplifier tube is held constant while the grid bias and driving voltage are varied (assuming no marked changed in plate efficiency), high bias and high driving voltage will result in a relatively high input impedance, while small bias and low driving voltage will give a relatively low input impedance.

From this we can conclude that low- $\mu$  triodes and Class C operation will result in higher input impedance than high- $\mu$  triodes and Class B operation, other things being equal. It is apparent, too, that a low value of input impedance

will, in general, be associated with relatively low values of fed-through power.

These generalizations have to be hedged with the "relatively" and "other things being equal" qualifications, since much depends on the actual operating conditions and the characteristics of the amplifier tube used. They are good, however, for comparing amplifiers operating at the same plate voltage, plate current, and plate efficiency.

The grid loss,  $W_{\rm G}$ , is not the major factor in determining the input impedance, but this does not mean that it is always — or even usually — negligible. Neither is it a constant element in the total driving power, since it will depend on the grid bias, driving voltage, loading, and the amplifier tube. It causes the input impedance to be lower than calculations based on fedthrough power alone would indicate, since the r.f. grid current is added to the driver's contribution to the r.f. output current to make up the total driver current.

The input impedance, like the fed-through power, depends on the plate loading. Lighter loading means smaller  $I_p$  and hence higher input impedance, and vice versa. If a grounded-grid amplifier is used with the object of providing a reasonably good match for a coaxial line without a tuned input circuit, the operating conditions must be chosen appropriately and adhered to strictly.

#### **Linear Amplifiers**

So far, the discussion has been based on the assumption that  $E_1$  and  $E_2$  have fixed values determined by the choice of operating conditions. When the amplifier is a "linear"—i.e, one capable of amplifying a modulated signal without introducing appreciable distortion—both  $E_1$  and  $E_2$  can vary from zero to some predetermined peak-envelope value. (However, most other operating conditions, such as plate voltage, bias, tuning and loading, are held constant in linear operation.)

By definition, a linear amplifier is one in which the ratio between the output voltage and driving voltage is constant regardless of the amplitude of the driving voltage. That is,  $E_2 = NE_1$ , where N is a fixed number for any value of  $E_1$  from zero to some maximum value determined by the permissible distortion at peak output. In the linear amplifier case  $E_1$  is a modulated voltage, and because of the fixed ratio between  $E_2$  and  $E_2$ ,  $E_3$  is modulated identically. The total output voltage, which is the sum of the two, is also modulated identically. Linear operation is accomplished by appropriate choice of operating conditions for the tube, these conditions being basically the same as with a grounded-cathode circuit.

In other words, the equivalent circuit is also valid in the linear amplifier case. The principal difference in the approach to finding numerical values is that the variability of  $R_{\rm G}$  with driving voltage has to be included if a complete picture of the input impedance over a modulation cycle is wanted. However, the major advantage of the grounded-grid circuit as a linear amplifier lies in

the fact that it has built-in "swamping" because of the fed-through power. Variations in input impedance tend to be minimized, as compared with grounded-cathode operation, because the percentage variation in the load on the driver is held to a relatively low value. It will usually suffice to base calculations on peak-envelope conditions. At lower levels of excitation the input impedance will rise, with most tubes, since the grid loss will decrease more rapidly than the fedthrough power as  $E_1$  is progressively reduced from the peak-envelope value. In any case, the maximum possible variation in input impedance can be found from the figure calculated from peak-envelope conditions with the grid loss included, as compared with a figure calculated by neglecting grid loss entirely and using only the fed-through power.

#### **Practical Calculations**

Most of the quantities used in the simple calculations outlined above can be found in data furnished by the tube manufacturers. Usually there is one conspicuous exception: the r.f. output voltage of the tube, designated  $E_2$  in this discussion. An acceptable approximation to it can be found by the following method:

- 1) Find the d.c. plate voltage, grid bias voltage, and peak grid signal voltage from the selected set of published typical operating conditions.
- 2) Subtract the grid bias voltage from the peak grid signal voltage. The result is approximately the minimum instantaneous plate voltage, since recommended operating conditions usually will be based on equal values of peak positive grid voltage and minimum instantaneous plate voltage.
- 3) Subtract the result found in (2) from the d.c. plate voltage. The difference is the peak plate voltage swing.
- 4) Multiply the result of (3) by 0.707 to obtain the r.m.s. value. This is the figure to be used for  $E_2$ .

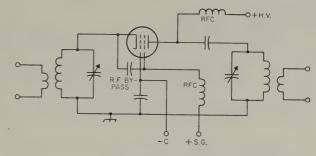
 $E_1$  is of course the r.m.s. value of the grid signal voltage; that is, 0.707 times the peak grid

T	Ā	В	L	E	Ι

Published Operating	811	-A	811-A	812-A	
Conditions	Class	$s B^*$	Class C	$Class\ C$	
Plate Voltage	1250	1500	1500	1500	
Grid Bias, volts	0	-4.5	-70	-120	
Peak Grid Voltage	87.5	85	175	240	
Plate Current, ma.	175	156	173	173	
Driving Power, watts	3.0	2.2	7.1	6.5	
Power Output, watts	155	170	200	190	
Calculated					
$E_1$ , volts	62	60	124	170	
$E_2$ , volts	825	1020	985	975	
$I_{\rm p}$ , amp.	0.188	0.166	0.203	0.195	
Fed-through Power, watts	11.6	10	25.2	33	
Total Power from Driver, wa	atts 14.6	12.2	32.3	39.5	
$I_{\nu} + I_{\rm g}$ , amp.	0.236	0.204	0.260	0.232	
Input Impedance, ohms	252	284	477	733	
Total Output, watts	167	180	225	223	

\* Values given are for one tube, taken from audio data.

Fig. 2—Grounded-grid circuit in which the screen grid acts as an accelerator of electrons but does not otherwise take part in the amplification process. This corresponds to the part played by the screen in normal grounded-cathode operation, but when connected in this way the No. 2 grid does not act as a shield between the input and output circuits.



voltage usually given in the published data.

An 811-A operated as a Class C amplifier will serve as an example. Typical operating conditions as given by the tube manufacturer include the following:

Plate voltage	1500 volts
Grid bias	-70 volts
Peak r.f. grid voltage	175 volts
Plate current	173 ma.
Driving power $(W_{\mathbf{G}})$	7.1 watts
Power output (W <sub>n</sub> )	200 watts

Using the above method of estimating, the minimum plate voltage is 175-70=105 volts, and the peak plate-voltage swing is 1500-105=1395 volts. Then

$$E_2 = 1395 \times 0.707 = 985 \text{ volts}$$
  
 $E_1 = 175 \times 0.707 = 124 \text{ volts}$   
 $I_p = \frac{W_p}{E_2} = \frac{200}{985} = 0.203 \text{ amp.}$ 

Fed-through power = 
$$E_1I_p$$
 = 124 × 0.203 = 25.2 watts

Total power from driver 
$$= 25.2 + 7.1 = 32.3$$
 watts

$$I_{\rm p} + I_{\rm g} = \frac{\text{Driver power}}{E_1} = \frac{32.3}{124} = 0.26 \text{ amp.}$$

Input impedance = 
$$\frac{E_1}{I_{\rm p} + I_{\rm g}} = \frac{124}{0.26} = 477 \text{ ohms}$$
  
 $W_{\rm out} = 200 + 25.2 = 225 \text{ watts}$ 

Notice that no use is made of the d.c. plate current in these computations. It was included in the list simply as a reminder that the loading must be adjusted to give this value of d.c. plate current in order that the calculated values of fed-through power and input impedance may be realized.

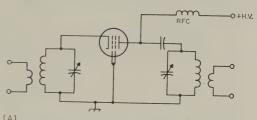
Table I shows the results of calculations of the same type on three sets of operating conditions for the 811-A and one set for the 812-A. Experimental measurements on setups using these tubes have verified the calculated values of fedthrough power and input impedance.

When tubes are used in parallel the values (for one tube) of plate current, grid driving power, fed-through power, and power output should be multiplied by the number of tubes. The figure for the input impedance should be divided by the number of tubes.

#### **Screen-Grid Tubes**

The methods described above can be applied to published operating data for screen-grid tubes

in similar fashion, provided the r.f. screen return is made to cathode rather than to ground, as in Fig. 2. However, this type of circuit has had little or no use in amateur transmitters, principally because it destroys the cathode-to-plate shielding that is essential for grounded-grid operation without neutralization. In the more commonly used circuit arrangements, shown in Fig. 3, the screen either is connected directly to the control grid, making the tube into a high- $\mu$  triode, or is operated with more-or-less normal positive d.c. screen potential but with the screen and control grid at the same r.f. potential. The latter arrangement is essentially low- $\mu$  triode operation.



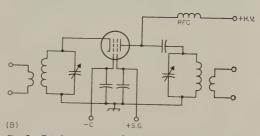
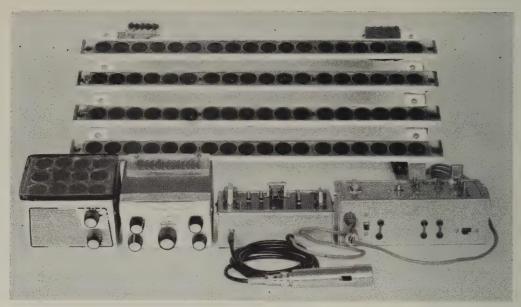


Fig. 3—Triode operation of screen-grid tubes in grounded grid circuits. In A the control and screen grids are connected together to operate as a high- $\mu$  control grid. In B, both grids are driven (with respect to cathode) by the same r.f. voltage but are operated with their normal d.c. bias voltages.

The same principles can be used in either case, but no operating characteristics are available from the tube manufacturers covering either type of connection. This is unfortunate, since there are more varieties of tetrodes than triodes in common use today. A tetrode in the circuit of Fig. 3B will allow feeding through comparatively large amounts of power from the driver, if that is a desirable consideration, as compared with the high- $\mu$  connection, and usually with less grid

(Continued on page 184)



The sun-powered station uses completely transistorized equipment. The receiver, at left, has a Regency converter with a Regency broadcast receiver as an i.f. amplifier. Transmitter has two home-built units, the modulator (center) and r.f. section (right). Solar cell batteries for the receiver are mounted on the tops of the two units. The rack at the rear has the solar cells for the transmitter. Ordinary dry batteries can be used instead, of course.

# Ten-Meter Transistorized Phone Transmitter

New Terrestrial DX Records on Solar Power

BY MAJOR GILBERT,\* K6LMW

The transmitter described in this article is part of a completely transistorized solar-powered amateur station. Two 2000-mile contacts, to Illinois, were made with the transmitter on September 13, 1958, on the 10-meter phone band, with signal reports of RS 57 and 59. On Sunday, September 21, stations in Texas. Missouri, and Minnesota were contacted with reports of 59, 55 and 59, respectively. These contacts were not pre-arranged and others have been made since. The operating frequencies are 28.82 Mc., 28.96 Mc., and 29.06 Mc.

Ever started out on Field Day and complained about the amount of equipment you had to haul to that mountain top? Here is a little rig that you can almost hold in the palm of your hand. It will operate from solar cells during the day and rechargeable or dry cells at night. It will give you plenty of good contacts. The frequency can be changed to your favorite band by using coils appropriate for the frequency. Power output will increase on the lower bands because the efficiency increases.

(Future plans call for a new transmitter, utilizing band switching, to be built covering 10 meters through 80 meters.)

The complete solar-powered amateur station is shown in one of the photographs. The receiver is a Regency TR-1A and the converter is a Regency ATC-1. Both units have been converted to solar power and they cover all amateur bands from 80 through 10 meters.

#### The Transmitter

The transmitter uses RCA 2N384 v.h.f. drift transistors throughout.

In the photograph of the r.f. chassis of the transmitter, the crystal oscillator section is at the

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The r.f. section of the transmitter. Oscillator-buffer-final run from right to left in this view, as described in the text.

right end with the forward-bias control protruding through the top of the chassis. The transistor to the left of the oscillator is the buffer-doubler, and the two side by side are the push-pull power amplifier.

The tuning controls for the oscillator and the buffer-doubler are located alongside the crystal at the rear of the chassis. The tuning control for the final can be seen protruding through the top of the chassis to the left of the final-amplifier transistors. The r.f. output BNC connector is at the extreme left on top of the chassis. The power-input plug is on the front panel at bottom left. The plug above it supplies collector voltage to the modulator unit and also delivers the d.c. to the modulated d.c. to the collectors of the push-pull final.

The switch next to the power plugs controls the voltage to all collectors of both the transmitter and modulator. The three pairs of jacks with the jumpers inserted are for monitoring collector current of the three stages and are, left to right, for the final, buffer-doubler and oscillator stages. The switch at the right side controls the forward-bias voltage for the oscillator.

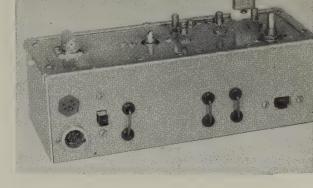
In the below-chassis view of the r.f. section the oscillator is at the extreme right end, the buffer-doubler is in left center, and the push-pull final is at the left end.

#### Construction Details

The transmitter is built on a  $2\frac{1}{2} \times 3 \times 8$ -inch LMB chassis box. The component placement was not found to be critical, nor was neutralization of the final found to be necessary.

The oscillator uses the Butler circuit, which is a very good transistor oscillator circuit at high frequencies. Although the oscillator is quite stable, the tap on  $L_1$  may have to be moved for crystals of different activity. Too much feedback will cause the crystal to lose control. The crystals used were 43-Mc. 3rd-overtone surplus units operated on their fundamental frequencies. If the crystal is replaced by a capacitor the oscillator will operate self-controlled on the frequency to which it is tuned.

The axis of the coils for the oscillator, bufferdoubler and final are at right angles to each other to prevent inductive coupling between stages.



Inductive coupling is used between all stages and the final has an adjustable swinging link. The buffer-doubler and final stages use the grounded-emitter arrangement and bias stabilization was not necessary since none of the stages showed any tendency toward thermal runaway. The forward-bias potentiometer is 50,000 ohms.

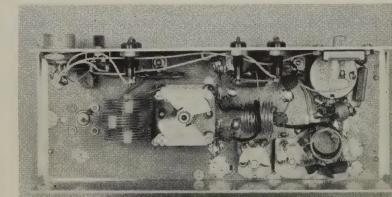
#### Modulator

The modulator circuit, also given in Fig. 1, is a straightforward audio amplifier utilizing standard Triad transformers, available from most parts houses.  $T_1$  is a Triad TY-59X with the windings reversed; that is, the winding that is normally the secondary is connected to the microphone (crystal or dynamic) to obtain a high input impedance, and the winding that is ordinarily the primary is connected to the modulator gain control.  $T_2$ , a Triad TY-52X, is connected conventionally. The modulation transformer,  $T_3$ , is a Triad T-41X turned around; the low-impedance winding is connected to the push-pull collectors of the output stage and the high-impedance winding is connected between the r.f. final coil center tap and the d.c. supply for the final r.f. stage collectors.

The modulator is constructed on a  $2 \times 3 \times 6$ -inch LMB chassis box. In the front view, the input transformer is at the left and the gain control is just in front of it. The driver transformer is in the center and the modulation transformer is at the extreme right. The microphone jack, a subminiature type, is mounted near the left edge of the front panel.

In the bottom view of the modulator unit the speech amplifier is at the left, the driver is in the center, and the push-pull output stage is at the right. The jack on the rear panel (lower edge, in this view) is the modulation test jack. High-impedance (4000 ohms) headphones may be plugged into this jack and 12 volts applied to the

Except for size, the three-stage transistor transmitter looks much like a corresponding low-power tube job underneath the chassis. Oscillator section is at the right in this picture.



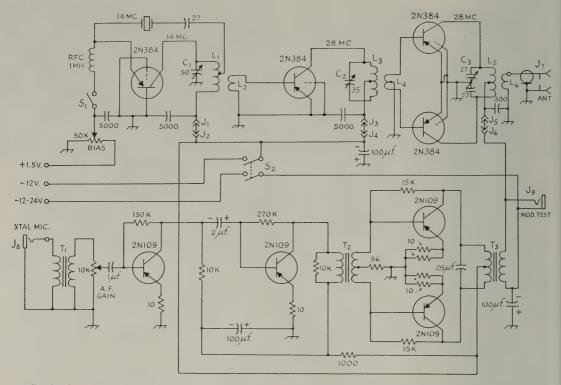


Fig. 1—Circuit diagram of the complete 10-meter transistor transmitter. Unless otherwise indicated, capacitances are in  $\mu\mu f$ ., resistances are in ohms, resistors are  $\frac{1}{2}$  watt. Fixed capacitors should be 25-volt or larger d.c.w.v. rating; units with polarities marked are electrolytic.

 $C_1$ —50- $\mu\mu$ f. air trimmer.

 $C_2$ —35- $\mu\mu$ f. air trimmer.

 $C_3$ —27  $\mu\mu$ f. per section butterfly (Hammarlund BFC-25).

J<sub>1</sub>-J<sub>6</sub>, inc.—Pin jacks.

J7—Coaxial chassis connector, type BNC.

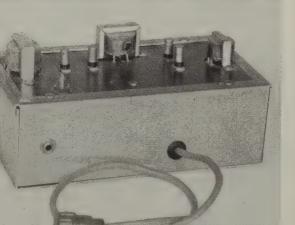
 $J_8$ —Open-circuit jack, miniature type.

J9—Open-circuit jack.

L<sub>1</sub>—9 turns No. 18, ¾-inch diam., ½ inch long, tapped 4½ turns from cold end. Adjust to resonate at 14 Mc., adding fixed capacitance across C<sub>1</sub> if necessary. Experiment with tap position if crystal does not lock in.

L2-1 turn No. 20, 3/4-inch diam.; insert between 4th and

The modulator layout is straightforward. Plug and cable in the foreground goes to the r.f. unit for interconnections. This connection system is not shown in the composite circuit given in Fig. 1, and may be modified to suit the builder's



5th turns of L1.

 $L_3$ —10 turns No. 20, c.t., 3/4-inch diam., 3/4 inch long. Resonate to 28 Mc.

L<sub>4</sub>—1 turn No. 20, ¾-inch diam., center-tapped. Insert in center of L<sub>3</sub>.

L<sub>5</sub>—Two sections 4 turns each, 1-inch diam., 16 t.p.i., 3/8 inch between sections (Air Dux 816).

L<sub>6</sub>—4 turns same as L<sub>5</sub>.

S<sub>1</sub>—S.p.s.t. slide switch.

S2-D.p.s.t. slide switch.

 $T_1$ —50,000 to 5000 ohm audio; see text (Triad TY-59X).

T<sub>2</sub>-20,000 to 2000 ohm audio driver (Triad TY-52X).

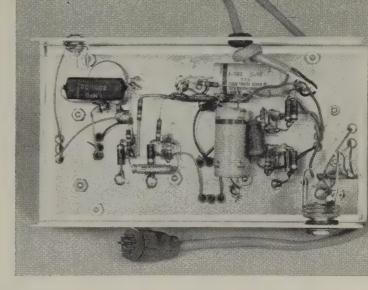
T<sub>3</sub>—200 to 1000 ohm audio driver; see text (Triad T-41X).

modulator to check modulation. With a 4000- to 3.2-ohm transformer plugged into this jack and a speaker connected to the 3.2-ohm winding, the modulator makes an excellent audio amplifier capable of delivering approximately 200 milliwatts of audio.

#### **Tuning Procedure**

To tune up the transmitter, first remove all of the jumper bars from jacks  $J_1$ - $J_2$ ,  $J_3$ - $J_4$ , and  $J_5$ - $J_6$ . Connect a 0–10-milliammeter between  $J_1$  and  $J_2$ . Before putting the transistor in the oscillator socket check the forward-bias control and make sure it increases the forward bias in a clockwise direction. Set the control in the extreme counterclockwise position. Plug in all the transistors and apply collector voltage. The meter in  $J_1$ - $J_2$  should read very little, but may have a slight upward movement. Advance the forward-

Simplicity is the keynote in the modulator wiring. Jack at bottom is to permit using the unit as an audio amplifier for other purposes than modulating the transmitter.



bias control in the clockwise direction and the meter will start to read up scale, and when the reading jumps up sharply the oscillator is func-

tioning properly.

Next, return the forward-bias control to the counterclockwise position and plug a 0-10 milliammeter in  $J_3$ - $J_4$ , and 0-20 milliammeter in  $J_5$ - $J_6$ . Place a 52-ohm ½-watt resistor across the output r.f. connector,  $J_7$ , or use a low-power r.f. wattmeter or r.f. indicator if either is available. Advance the forward-bias control, while watching the meters, until the buffer-doubler current is approximately 6 ma. Tune the oscillator tuning condenser for maximum buffer current. (Caution: Do not exceed 10 ma. as it will damage the transistor.) If the buffer current exceeds 8 ma., reduce the forward bias to the oscillator and continue tuning the oscillator to resonance. When the buffer current is peaked adjust the forwardbias control so that the buffer current is approximately 6 ma. Now, adjust the buffer tuning control for maximum drive to the final. Do not exceed 20 ma. final collector current. The forward bias on the oscillator may have to be further reduced to keep the final collector current under 20 ma.; however, it was not found to be necessary in this transmitter.

Typical currents are listed below:

Oscillator 1-2 ma. Buffer 6-8 ma. Final 4-6 ma.

Modulator Total Drain

Idle 4 ma. Average Current 15 ma. Voice Peaks 40 ma.

Tune the final for maximum output, then adjust the swinging link for maximum output as indicated by the r.f. indicator and you are ready to go on the air. Recheck tuning of all stages and adjust the forward bias so that all collector currents are approximately as shown in the table. If an r.f. indicator is not available, connect a piece of wire to the antenna terminal of your receiver, tune to your operating frequency and adjust the final tuning and link for maximum S-meter reading. Do not try to tune the oscillator and buffer this way.

Power output is approximately as follows:

12 volts on all stages — 30 milliwatts

12 volts on oscillator and buffer, 24 volts on final — 60 milliwatts

12 volts on oscillator and buffer, 28 volts on final — 75 milliwatts

#### **Power Supply**

The solar-cell power supply for the transmitter is composed of 72 Hoffman Type 2A silicon solar cells, manufactured by the Semiconductor Division, Hoffman Electronic Corporation, Evanston, Illinois. The forward-bias cell is five Hoffman 120C solar cells.

## Strays

W2TOX, 15 years old, wonders if he is the youngest ham on radioteletype.

More gear stolen. A Morrow MB560 transmitter and a Morrow MBR5 converter were stolen from K6BZX during September. (No serial numbers given.)

W1BTI ("Neat and Clean," page 69, October

QST) says that a number of fellows have asked him about the conelrad system he is using. It was adapted from Hints and Kinks in the January, 1957, issue of QST, page 49.

More aids for those who wish to build up neat operating positions but who aren't very handy with hammer and saw. Bulletin 4458 by Bud Radio describes a new line of console assemblies.

# • Recent Equipment -

## Globe Sidebander DSB-100

LTHOUGH the name would indicate that the m A DSB-100 is strictly a phone transmitter, such is not the case. The DSB-100 is a combination job that runs 50 watts input on c.w., 40 watts on a.m. and 100 watts p.e.p. input on d.s.b. (double sideband, no carrier). If you're wondering why d.s.b. and not s.s.b. (single sideband), read on. A d.s.b. signal is very easy to produce, and this means that a d.s.b. transmitter will be much less expensive than one that generates but one sideband. A d.s.b. signal has little or no carrier, so it creates no heterodyne interference on the band. Furthermore, the available power goes into sidebands, where it does some good at the receiving end, instead of into a carrier that does little more than set an S meter. A d.s.b. signal can walk into a group of single sidebanders and join them just as though it was an s.s.b. signal, since most of the receivers these days have enough selectivity to make an s.s.b. signal out of a d.s.b. one.

Perhaps this last point needs some elaboration. An s.s.b. signal is received with the receiver b.f.o. on, to furnish the "local carrier" for demodulation of the signal. If the signal is mistuned with respect to this local carrier, the signal becomes high-pitched or low-pitched, and unintelligible if the mistuning is too great. However, there is a mistuning region of 50 to 100 cycles or so in which the intelligibility is adequate (even if the fidelity is not) for communication. This is not true of a d.s.b. signal. With a d.s.b. signal there is little or no room for a tuning error; the carrier must be reinserted in the proper frequency and, worse yet, proper phase. These requirements are impossible to meet with the normal a.m. or s.s.b. receiver, and by now you must be wondering how in blue blazes Globe expects to peddle any

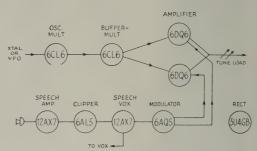


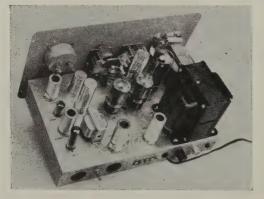
Fig. 1—Block diagram of the DSB-100 phone and c.w. transmitter. Clipper in the audio amplifier holds the modulation at a high level without exceeding the limits of linearity in the output stage.

d.s.b. rigs if no one can copy the signals!

The answer is very simple. Most receivers have enough selectivity to lop off one sideband of a double-sideband signal, so all that is necessary to copy a d.s.b. signal is to tune it in like s.s.b. on a selective receiver. The signal is made s.s.b. before it reaches the detector. If there is one disadvantage to d.s.b. it is that you may occasionally run into a fellow who doesn't have enough receiver selectivity to copy you well. In that case you can swing over to a.m. But the majority of the time you will be working the s.s.b. gang, and enjoying the advantages of s.s.b., including voicecontrolled break-in, Yes, d.s.b. when used intelligently can be very effective. If you have any doubts, ask the old timers in the s.s.b. gang about Wayne Cooper, YN1WC (and several other calls). He worked d.s.b. for some time before more than a few of the s.s.b. boys realized he had a pair of sidebands.

The Sidebander DSB-100 was apparently de-

The DSB-100 is a compact (8 by 8 by 14 inches) self-contained transmitter. Crystal-controlled operation requires that a crystal be plugged in the right-hand octal socket on the rear apron; for v.f.o. operation the v.f.o. signal is introduced at the same socket. The dull coating on the meter (upper left) is a copper flash used to shield the meter.





signed to get the most effective d.s.b. rig possible consistent with operating convenience and low cost, Referring to the block diagram, Fig. 1, it starts out with a 6CL6 crystal-oscillator stage that operates on 80 or 40 meters, depending upon the band in use. This crystal-oscillator stage is used as a buffer or multiplier if an external v.f.o. is used. A second 6CL6 is used as buffer or multiplier, again depending upon the band in use, but its output circuit is such that push-pull excitation is available for the output stage. But the plates of the output tubes are connected in parallel to a pi network, and you probably wonder "What's all this jazz about push-pull drive and parallel output?" Simple. One form of "balanced-modulator" circuit uses push-pull drive, parallel output and push-pull audio, and that is exactly what this pair of 6DQ6s does. A balanced modulator is a device that generates sidebands with little or no carrier, and that's what we have here. For c.w. or a.m. operation, the d.c. cathode circuit of one 6DQ6 is opened, leaving the remaining tube to act as an amplifier neutralized by the inactive tube. Panel controls are available for grid and plate tuning and loading of the final; the coupling between 6CL6s is fixed-tuned, peaked for the required frequency band. A milliammeter can be switched to read final grid or cathode current.

In the audio department, both triodes of a 12AX7 serve as the speech amplifier to build up the microphone signals. The input triode can be switched to serve as an audio oscillator for tune-up and test; a nice touch there is the use of a printed-circuit assembly for the feed-back network. Using these constants, the frequency runs around 700

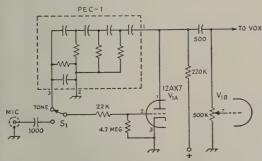
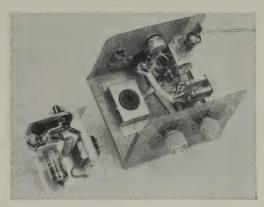


Fig. 2—Test-oscillator circuit used in the DSB-100. Capacitances are in  $\mu\mu$ f. PEC-1, surrounded by dashed lines, is a Centralab printed electronic circuit, designated 1109–003 in the DSB-100 instruction book. (We were unable to find the values of its components.) One could be bought from Globe as a replacement part.



The VOX-10 (right) and the plug-in QT-10.

cycles. The circuit is given in Fig. 2, for anyone who might want to add this feature to his present transmitter.

Following the 12AX7 there is a 6AL5 diode clipper that holds down the signal to a level determined by the fixed bias on the diode. Since clipping generates harmonics, the clipper is followed by a low-pass filter that minimizes these high-frequency components. The clipped signal is amplified again and the 6AQ5 modulates the screens of the 6DQ6s. There is no need to worry about bias and audio levels and other adjustments when switching from a.m. to d.s.b. and back; once the initial adjustments have been made the mode switching takes care of everything.

The VOX mentioned earlier and indicated in Fig. 1 is not built into the DSB-100, VOX operation is obtained through the use of the Globe VOX-10, a self-contained unit measuring  $4\frac{1}{2}$  by 6 by 5 inches that makes up to the DSB-100 through a cable and a socket on the rear apron of the DSB-100. The VOX-10 has a 12AX7 in it, one triode serving as a diode rectifier and the other as a relay control tube. The hold-in time is adjustable at the rear of the unit, while the VOX sensitivity is a panel control. A plug-in unit, the QT-10, provides VOX operation with a loud-speaker. The QT-10 also uses a 12AX7, one triode as amplifier and the other as diode rectifier. Rectified audio output from the receiver biases the rectifier in the VOX circuit so that loud-speaker signals cannot operate the VOX via the microphone.

The DSB-100 and VOX-10 are available wired or in kit form, — B. G.

## The Heath Mohawk Receiver Kit

Transmitters for all modes and power levels in kit form have been with us for some time, but until recently no serious ventures had been attempted into the more difficult field of communications receivers. The Mohawk represents one of the first efforts to compete with some of the

better-grade factory-built receivers. It is no short-wave receiver with bandspread thrown in as an afterthought. Both mechanically and electrically, its design follows principles that set a "communications-type" receiver apart from the "all-wave" tuner.

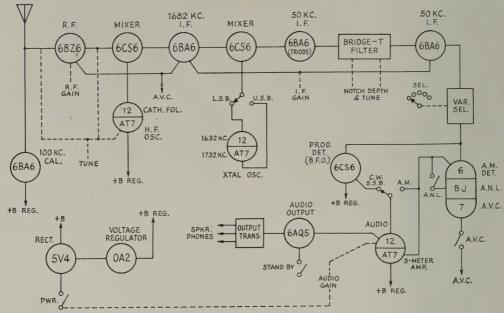


Fig. 1—Block diagram of the Heath Mohawk receiver showing tube line-up and controls.

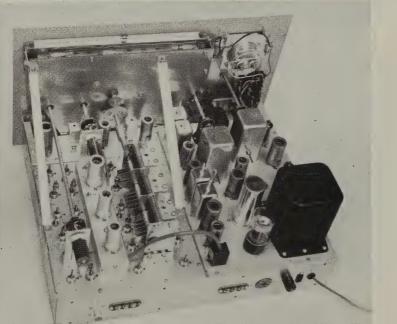
Essentially it is a ham-bands-only dual-conversion superhet with a tunable front end, covering all bands, 160 through 10 meters. There is also a dial calibration for 6 and 2 meters to be used when feeding converters into the receiver. There are 15 tubes, including the power rectifier and a VR tube. Four of these are multipurpose.

#### Circuit

A block diagram of the receiver tube line-up is shown in Fig. 1. In brief, a single r.f. stage feeds a mixer converting signal frequency to 1682 kc. A single amplifier stage at 1682 kc. feeds a second mixer converting to 50 kc. Two stages at 50 kc. then feed either a diode detector for a.m. or a

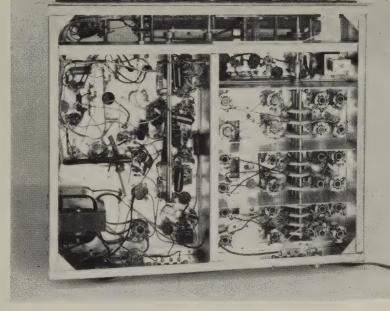
product detector for c.w. and s.s.b. The line-up ends with an audio amplifier and a power-output stage. Auxiliaries are a sideband selector, automatic series noise limiter, a.v.c. rectifier, S-meter amplifier, bridged-T filter, i.f. selectivity control and a 100-kc. crystal calibrator.

The r.f. stage uses a 6BZ6. This stage has a separate gain control that will help to contain the ham in the next block as well as that commercial outside the low end of 20. The input coupling coils are tapped for either balanced (150–300 ohms) or unbalanced (50–72 ohms) input. A standard coax connector at the rear makes the latter connection convenient. An antenna trimmer has a control on the front panel.



The Mohawk is made up of three subassemblies which mount on an open chassis frame. The section in the foreground at the left is the preassembled and wired front end. Extension shafts operate the antenna-trimmer and dial-calibration capacitors. The strip close to the panel at the left contains the 1682-kc. first i.f. circuits. Lowfrequency i.f., audio and power circuits are in the large section to the right. Double panel construction and panel bracing assure good mechanical stability.

The r.f. oscillator and mixer sections of the preassembled front end are separated by shielding partitions. The band switch and all coil forms are ceramic. Near the upper righthand corner, a clamp holds the twin crystals of the selectable sideband system in their sockets. The gang switch in the left-hand compartment controls the i.f. selectivity. All control knobs on the panel are of cast aluminum.



"Pulling" effects are minimized by coupling the high-frequency oscillator to the No. 3 grid (used here as the injection grid) of the 6CS6 first mixer through a cathode follower. A 12AT7 dual triode performs the functions of oscillator and follower. The first mixer feeds a single amplifier (6BA6) at 1682 ke.

The two triode units of another 12AT7 in twin crystal-controlled oscillators, one 50 kc. above and the other 50 kc. below the 1682-kc. i.f., feed the 6CS6 second mixer. A switch selects one or the other of the oscillators depending on whether

the upper or lower sideband is wanted.

In the two-stage 50-kc. i.f. amplifier which follows the second mixer, double-tuned circuits, with the tubes tapped down on both input and output coils to maintain high Q, are used between the mixer and the first i.f. stage (6BA6, triodeconnected), and between the second i.f. stage (6BA6) and the detector. These circuits are coupled capacitively, and loaded with resistance when a wider pass band is wanted. Five degrees of selectivity, from 5 kc. to 0.5 kc., are provided by a switch that varies the coupling and the loading simultaneously. Coupling between the two i.f. stages is simple capacitive except when a switch is thrown to insert the bridged-T filter for attenuating an interfering heterodyne. The position of the notch in the pass band and its depth (up to 50 or 60 db.) are independently adjustable. Only the 1682-kc. amplifier and the second 50-kc. amplifier are on the manual i.f. gain control.

One of the three diode sections of a 6BJ7 is used as the a.m. detector. Of the two remaining diodes, one is the a.v.c. rectifier and the other a series noise limiter. A.v.c. (delayed) is applied only to the r.f. stage and the 1682-kc. amplifier. The a.m.-s.s.b./c.w. switch substitutes a 6CS6

product detector for the diode.

One triode section of a 12AT7 is used in the first audio amplifier where audio gain is controlled. The other section is an S-meter amplifier.

This amplifier takes a signal from the a.m. detector through an RC network. The S meter is in the cathode circuit. The meter is calibrated for an S9 reading with a 100- $\mu v$ . signal on 10 meters. Headphone output, of which there is plenty for either high- or low-impedance headsets, is taken from a 500-ohm tap on the output-transformer secondary. The speaker (not included) is automatically shorted out when the headphones are plugged in. The stand-by switch kills the audio output by inserting a high resistance in the cathode of the output tube. The remaining tubes in the receiver remain in normal operating condition to minimize temperature variations.

The receiver includes a 100-kc. crystal calibrator operated by a push button on the panel. A trimmer in the h.f. oscillator circuit can be adjusted from the panel to bring the dial calibration into alignment.

Plate voltage for the first h.f. oscillator and cathode follower, the product detector (b.f.o.) and the S-meter amplifier is regulated at 150 volts by an 0A2. With the use of converters for the 6- and 2-meter bands in mind, plate voltage, filament voltage, a.v.c. voltage and a remote connection for the stand-by switch are available at an accessory socket at the rear of the receiver.

#### Assembly

The producers of the Mohawk kit have taken most of the headaches (for themselves as well as the customer, we imagine) out of the assembly and alignment by furnishing the front end (bandswitching r.f., h.f. oscillator and mixer stages) completely assembled, wired and aligned as a unit that mounts in the main chassis with a few screws. The only wiring necessary is to make the connections to the antenna terminals. Power-supply and signal-output connections are made by means of cables and plugs already assembled. Also, most of the power and control wiring is in

Continued on page 186)

## • Technical Correspondence

#### THE SLOT ANTENNA

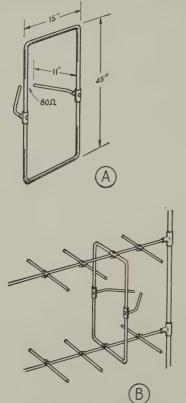
147-17 Charter Road Jamaica 35, New York

Technical Editor, QST:

While in England this summer, I had the opportunity to talk over 2-meter activities with Mr. John A. Rouse, G2AHL, of the Radio Society of Great Britain. He told me about an antenna type which has become very popular—almost standard—for 2-meter work, called the "skeleton slot" or simply the "slot antenna."

The antenna is derived from the aircraft slot antenna, in which a resonant slot in a metal panel (the skin of an aircraft, for example) is driven. The slot is the antenna, not the metal panel. Mr. B. Sykes, G2HCG, who did much of the original work on skeleton slots, was interested in discovering just how much of the paneling might be cut away and still retain the characteristics of the slot antenna. He finally wound up with a thin (½-inch or so) metal rod enclosing the slot.

In diagram A (which gives the dimensions generally used on 2 meters) the slot antenna looks at first glange to be something like a quad, but it behaves quite differently.



The slot antenna has been described as two horizontally-polarized (bent) dipoles — the shaded part of the diagram — with high-impedance open-wire "feeders" joining the ends together. For optimum performance it seems that the impedance of these "feeders" should be 500–600 ohms. The point at which the dipoles end and the feeders begin is thus not clearly defined, and it is believed that this results in the broadband properties of the antenna as compared with a resonant dipole.

Feed is accomplished by means of a delta match connected equidistant from the two dipoles along the open-wire "feeders." This transforms the impedance down to 80 ohms or other line impedance as required.

The slot antenna, considering that it might be looked at as a collinear arrangement, does not show impressive gain over a dipole. However, gain is not the case in point. A most attractive feature of the slot antenna is that the match to the feeders seems to be constant over a wide range of conditions. One possible explanation is that the dipoles are "self-adjusting" for the reason already given; as the frequency or other condition changes, the length of metal which behaves like a radiator changes also.

This simplifies the use of the slot antenna as the radiating element in a number of practical arrays. It is frequently used as the driven element in stacked Yagi beams such as the "5 over 5" shown in "B." In this case, the impedance of the antenna (with the delta match) remains at 80 ohms; the drop in impedance we would expect as elements are added does not occur. A recent article in the RSGB Bulletin described two slots, one-eighth wavelength apart, driven 45 degrees out of phase, to give increased gain and some front-to-back ratio advantage. Another article showed how to make a turnstile slot to get horizontally-polarized omnidirectional radiation.

British amateurs seem to have taken to the slot antenna because of this factor and because of its physical ruggedness and ease of construction. The centers of the dipoles are theoretically at ground potential, making the antenna easy to mount.

Commercially-manufactured arrays using the slot are available in Great Britain for the 2-meter and 70-cm. bands, using up to 15 elements, with claimed gains up to 15 db. It might be interesting to do some experimenting with the slot antenna, especially at the frequencies above 144 Mc.

— Julian N. Jablin, W2QPQ

# AMATEUR SATELLITE RECEPTION AND RECORDING

Geophysics Research Directorate
Air Force Cambridge Research Center
Air Research and Development Command
Laurence G. Hanscom Field
Bedford, Massachusetts

Technical Editor, QST:

The response of amateurs and others to the request for measurements of the U. S. satellite signals has been gratifying and, as was expected, has provided valuable information. I would like to review very briefly the two major fields of measurements that may be undertaken by independent investigators such as amateurs and s.w.l.'s.

The first field is that of doppler measurement which requires the use of receiving equipment of a high degree of frequency stability. It must not be subject to either local or beat oscillator drift nor a.g.c. frequency-pulling effects. These measurements, then, require the use of a crystal controlled heterodyne oscillator at the carrier frequency, or a subharmonic thereof, or a receiver whose internal construction provides a comparable stability. These measurements can and are being made by various amateurs and the data obtained will be of value in many cases.

The second major contribution is the direct recording of telemetry signals from the satellite transmitters. We have had occasion to request the loan of quite a few amateur tape recordings of satellite telemetry signals which were recorded at what was considered to be critical periods. It has been noted that in all cases they suffer from one particular defect—the use of a heterodyne oscillator either at the carrier or intermediate frequency. It is likely in most cases the heterodyne oscillator was used for doppler measurement purposes.

Simultaneous doppler measurements and telemetry reception by the same receiver tend to be incompatible. Assuming an amplitude modulated transmission, two reasons may be advanced to support this statement:

1. A beat oscillator produces its strongest output signal by heterodyning against the carrier frequency itself. The fact that this frequency varies because of receiver instability and/or doppler shift makes it exceedingly difficult to remove with a filter. If the heterodyne falls within a desired telemetry channel and close to the telemetered frequency, the data becomes almost impossible to read. This is generally true at least part of the time.

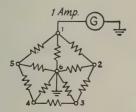
2. The beat oscillator also heterodynes against the side-(Continued on page 180)

# Quist Quiz

Feeling that the v.h.f. men have been neglected by this department, Sam Goldish, W5TVG of Tulsa, sends us the following puzzler:

A 6-meter man has a ¼-wave vertical antenna made of solid aluminum rod ¾ inches in diameter and 1.7 yards long. He wishes to take it with him on a train, but the conductor won't allow it in the coach and the baggage man won't accept any article whose greatest dimension exceeds 1 yard. The resourceful v.h.f. man figured out a way to take his antenna on the train. Can you?

The key to last month's problem was the symmetry of the circuits. If the circuit is drawn for the generator delivering 1 ampere, it looks like this:



Obviously the voltages at points 3 and 4 are the same, and there is no current flow through  $R_{34}$  from the generator delivering 1 ampere. Similarly, from the other generator there is no current through  $R_{15}$ .

Finding resultant values of resistors and using the laws of Kirchoff, the currents from the generator delivering 1 ampere are

$$i_{15} = i_{12} = 3/11$$
 amp.  $i_{16} = 5/11$  amp.  $i_{26} = i_{56} = 2/11$  amp.  $i_{23} = i_{36} = i_{54} = i_{46} = 1/11$ 

The currents from the generator delivering 2 amperes are

$$i_{32}=i_{34}=6/11$$
 amp.  $i_{36}=10/11$  amp.  $i_{26}=i_{46}=4/11$  amp.  $i_{21}=i_{16}=i_{45}=i_{56}=2/11$ 

Summing the results,

$$I_{13} = (i_{12})_1 + (i_{12})_2 = (i_{12})_1 - (i_{21})_2 = 3/11 - 2/11 = 1/11$$
 amp.  
Similarly,

#### FEEDBACK

In the circuit diagram of "Pygmy Powerhouse II" on page 12 of the October issue, the length of the v.f.o. coil,  $L_1$ , should be  $1\frac{5}{8}$  inches instead of  $\frac{5}{8}$  inch.

## December 1958

## Silent Keys

I'm is with deep regret that we record the passing of these amateurs:

W2ASG, Luther Mkitarian, Haddonfield, N. J. W2JYG, Charles F. Polsten, Sayville, N. Y. K2ZYT, Ralph W. Scott, Westmont, N. J. W3DGB, William E. Heiser, Shamokin, Pa. W3IQN, John B. Thomas, York, Pa. \* W5VHW, John V. Harwood, jr., Andrews, Texas W6QYQ, Raymond J. Heringer, Clarksburg, Calif. W7RPL, Orvil J. Hansen, Richfield, Utah K8BDW, Harold J. Kell, Lansing, Mich. W9IQC, W. Gordon Currie, LaSalle, Ill. WØCJS, Marion J. Junkins, Watertown, S. Dak. K9EYI, Leslie B. Vennard, Burlington, Iowa WØZT, Burton S. Waldron, Minneapolis, Minn.



#### December 1933

... For the technical man there was info on preselection and image rejection in shortwave superhets, a phone and c.w. transmitter using the new type 800 tubes, dope on the sins of overmodulation, an amplifier using an RK-18 tube, and a couple of pages of hints and kinks for the experimenter.

... For the man interested in operating matters, there were reminiscences of the ten-years ago (now 35 years ago) exploits of working across the Atlantic for the first time, dope on 56-Mc. tests from an MIT airplane and on a simple break-in system for the phone operator, and Byrd Expedition news.

. . . Also, this issue carried announcement of the Fourth All-Section Sweepstakes contest, which was to run for nine days during the middle of December.

# Strays

K2GC/4 tells us that this is how they service antennas at K4WMA. This thing is known as a cherry picker, and will go as high as 60'. Its auxiliary function is to service Corporal missiles.







Because only a contest-type iron man can perform capably for a 24-hour stretch, teams usually are scheduled to go on and off duty at regular intervals. These two Nineland groups believe operator efficiency is increased when shut-eye time is provided. At left, K9AXO pounds bug and KN9MXW logs while K9IZI snoozes at K9WBT/9. But all good things must come to an end, and in the Chicago Tribune pic on the right, K9CYS rouses K9JAU to take early morning trick on transmitter for Chiburban Radio Mobileers' K9ATM/9.

## Record 11,316 Hams on 1958 Field Day!

Sideband and V.H.F. Activity Zooms but Many Scores Plummet as Aurora Rips Bands

BY PHIL SIMMONS.\* WIZDP

YONDITIONS were the worst experienced during any Field Day since 1946. Things started off with one-way skip. Incoming signals were S9 but no replies were received regardless of antennas tried. The evening produced one of the most breath-taking aurora displays ever witnessed. This resulted, however, in a nearly 100 per cent black-out on all bands below 28 Mc. For almost four hours, neither of our two stations made a single QSO. While it is tempting to sleep at such times, the chance was not taken for fear of a sudden band opening."—VE2CB/2..."Pretty northern lights and pretty dead bands. Contacts were so far apart we never needed loggers to help our operators." — K9GUY/9... "We could hear other parts of the country work each other during the fade-out but we were dead often as long as two hours. Tough on the score!" —  $W\emptyset DKI/\emptyset$  . . . . "The best location, equipment and antennas available for the grand attempt to beat the top W8 contact total came to naught when aurora folded the bands early Saturday. 16 QSOs with a full wave on 80. Horrible!" — W8DJN/8. . . . "Highest noise level in six years of FD." — VE3SCD/3. . . . "Let's try to arrange a week end free from aurora disturbances." — K9DVF/9. . . . "Never saw such rotten conditions. Almost a complete black-out.

Very discouraging."— VE2CO/2. . . . "At East Aurora, N. Y., we were in the right spot for the flutter. Reception was absolutely impossible at times." — W2PET/2. . . . "The bright aurora June 28 completely wiped out all bands below 14 Mc." — W7SSF/7.... "When the northern lights took over, we watched 'Gunsmoke' on a portable TV." — W3CYU/3. . . . "Although we had an ideal QTH with antennas pointed at U. S. A., we don't remember having seen the bands poorer. Guess all VE2s were in the same boat." — VE2JB/2. . . . "Never have conditions been so awful. Saturday night produced some beautiful aurora but we had no 50-Mc. gear. The flutter was evident all evening on 20 and 40, and 15 and 10 were useless." —  $W\emptyset IO/\emptyset$ . . . . "Our hilltop location gave the night shift a beautiful view of the northern lights but for some reason the display was not appreciated." - W9AML/9. . . . "How could you have chosen such a date for this wonderful event? Or should I say, 'Who stole 80 meters?' Imagine making 15 contacts on a band that last year netted ten times that amount." - VE3FT/3. . . . "WWV said the bands would be useless to very poor, a prediction which turned out to be correct. All in all it was a poor FD for Alaska." — KL7COJ/KL7... "The brilliant display, visible in the sky for hours, gummed up signals so they sounded as if they were originating from the

<sup>\*</sup>Asst. Communications Manager, C.W., ARRL.

depths of Tibet. The watery, hollow, fluttery characteristic kept up for hours, with contact averages dropping far below the normal anticipated." -W9PCS/9. . . . "The aurora brought about our lowest score yet, and v.h.f. beat out the l.f. bands for the first time." -VE3JJ/3. . . "Please make aurora borealis illegal during the FD period." -W7ROY/7.

Yes, the theme was unquestionably aurora! Those remarks are characteristic of plenty more that appear later in the "quotes" in this summary. The disturbance itself was a lovely phenomenon to behold. The reason for the grousing, naturally, was the effect on QSO-perhour totals and resulting lower scores. The overall club leader last year scored 24,327 points to the 1958 leader's 23,553. The top ten clubs in 1957 averaged 16,400 points to this year's 15,600. Last year's three top-ranking Class-B entries averaged 6600 points to 1958's 4200. The northeastern, midwestern and northwestern states, Canada and Alaska were especially hard hit.

Yet every cloud has its silver lining. Those well-equipped for 50- and 144-Mc. work, c.w. particularly, actually *enjoyed* the longest, most potent aurora session ever to occur in 22 Field Day holdings. Similarly, the long skip and north-south propagation dominating the low-frequency bands were a break for stations in the southern latitudes, where some Fours, Fives, Sixes and Caribbean entrants registered record-busting tallies for their areas.

For those in the aurora belt who were bitterly disappointed in their results, there's this redeeming feature. It should be a breeze to improve in 1959. Just wait till next year!

Anyone laboring under the delusion that the 1958 Field Day was a flop should examine these statistics:

Number Afield	1957	1958	Improvement
Hams participating	10,264	11,316	up 10.2%
Portables & mobiles	963	1086	up 12.8%
Separate xmtr-rcvr combinations	2394	2629	up 9.8%

And so the picnic-type funfest chugs along attracting roughly five times the amateurs in the 1957 Sweepstakes, seven times as many as the 1958 DX Competition, and ten times as many as the 1958 V.H.F. SS, thus maintaining its position as ARRL's most popular spot activity, bar none.

Moving up a notch, Garden State Amateur Radio Association's W2GSA/2 netted 23,553 points and 2590 contacts, both tops for the 1958 Field Day. The 43 ops counted on 11 transmitters, all using 829 or 6146 final amplifiers at 30 watts. Maximum use of bands and modes played a major part in GSARA's success. Of the 2590, 985 QSOs were c.w. and 1605 phone. Best band was 20-meter A3 worth 386 while v.h.f. paid off handsomely at 363. S.s.b. accounted for 14 per cent of all phone work.

Another New Jersey outfit, the Tri-County Radio Association of Plainfield, was next with 18,711 points and 2064 contacts. Using 12 v.f.o.-controlled rigs, a humming 6-kw. generator, and lots of code on v.h.f., the gang also found s.s.b. a valuable score-booster. Hottest spectrum portion proved to be 21-Mc. phone, good for 258 QSOs. The menu included steak and beans Saturday evening, soup and snacks at midnight, bacon and eggs for breakfast and a lush roast beef dinner Sunday. Obviously the commissary committee kept the 56 tummies at W2LI/2 well filled and merits plenty of credit for Tri-County's high standing.

Third among club portables was Fordham Radio Club's W2JIO/2 with 17,793 points and

Left: Members of Irvington Radio Amateur Club, W2ODP/2, cluster 'round genny in wee hours to solve eternal Field Day riddle: "Why did the darn thing conk out?" Those shown include W2WDZ with instruction book and saddened Chief Op W2ZMH, now QRT, holding up tree. Right: Greenery abounds for (from left) K6UVK, K6EQT (eclipsed), K6QWB and K6ZVY of Aerojet Amateur Radio Club's W6IJK/6. The Jackson City site is near spot where gold was first discovered to precipitate California gold rush of late 1840's. AARC scored 4731 in 3A.







The Garden State Amateur Radio Association gang faces the camera happily after racking up the top score and contact total of the 1958 Field Day. Text has details on W2GSA/2.

1952 stations worked, a superb showing for just eight transmitters, as W5SC/5 of San Antonio Radio Club landed fourth position courtesy of 16,050 points and 2099 valid contacts.

Here are the other 14 setups that broke 10,000: W10C/1 14,904, K6DTA/6 14,796, K2AA/2 13,401, W6UF/6 12,786, W2VDJ/2 12,537, K6EA/6 11,859, K6BAG/6 11,823, K6BF/6 11,124, W2OYH/2 11,061, W2GTD/2 10,818, W3RCN/3 10,584, W7HZ/7 10,467, W2OR/2 10,212, W9RK/9 10,134.

Inasmuch as competition for Field Day honors under the rules is betwixt stations employing like numbers of simultaneously-operated rigs, it is fitting that ARRL send kudos to these 13 clubs, all winners in their respective classes, and identify them in large type for all to see:

Class	Call	Club Name	Score
1A	W5EKK/5	Manzano Soc.	6534
2A	K2FC/2	Order of Boiled Owls	6525
3A	W4FU/8	Ohio Valley AR Assn.	9954
4A	W2OYH/2	Morris RC	11,061
5A	K6BAG/6	Pacific RC	11,823
6A	K2AA/2	South Jersey R Assn.	13,401
7A	W2VDJ/2	Lakeland AR Assn.	12,537
8A	W2JIO/2	Fordham RC	17,793
9A	W1OC/1	Concord Brasspounders	14,904
10A	WØGM/Ø	Cedar Valley ARC	2640
11A	W2GSA/2	Garden State AR Assn.	23,553
12A	W2LI/2	Tri-County R Assn.	18,711
13A	W6UF/6	Eimac Gang RC	12,786

For geographical comparisons, study these call area leaders:

14,904	KL7AA/KL7	1290
23,553	KP4WV/KP4	5472
10,584	KZ5AF/KZ5	9078
5904	VE1AEP/1	2250
16,050	VE2CB/2	2205
14,796	VE3NAR/3	4740
10,467	m VE5MA/5	240
9954	VE6NQ/6	1278
10,134	VE7ARV/7	3375
4272	W2ZRX/V01	942
5517		
	23,553 10,584 5904 16,050 14,796 10,467 9954 10,134 4272	23,553 KP4WV/KP4 10,584 KZ5AF/KZ5 5904 VE1AEP/1 16,050 VE2CB/2 14,796 VE3NAR/3 10,467 VE5MA/5 9954 VE6NQ/6 10,134 VE7ARV/7 4272 W2ZRX/VO1

Sixes monopolized Class 1B, paced by battery-juiced K6GOI/6 and his buddy W6AWP with 4725 points, 323 QSOs, after which came K6QIK/6 and K6QHZ and their score of 3969. Third-high tally among all unit-individuals and leading one-man station was W3MSR/8 who got 3842 points and the top Class-B QSO total of 402. Other outstanding scores: W2JBQ/2 3416, W6DUS/6 3096, K4KUZ/4 2448, K5DRC/5 2403, W6IXK/6 2400, top Novice KN2LFK/2 2309, W8MZA/8 2232. Over in 2B K5DCO/5 and K5DGI went great guns for 370 contacts and 3330 points. Also in there were K6HGF/6 2880, VE2NI/2 2646, K4DTI/4 2529.

Cleveland's Westpark Radiops received and relayed hundreds of FD messages to continue their mastery of the club mobile aggregate listings for the sixth straight time. With 32 mobile units active, their 71,717 aggregate was down a hair from previous years but still good enough to command first place in a walk. Member W8PVC/8 led Class 1C in contacts and score with 280 and 5036 respectively. Then came K6EPC/6 and second op W6HBF with 213 stations worked and 3213 points, although the pair found out 15 minutes before zero hour that "some dope in the service station had charged our battery backwards!" Thirty of the next 31 mobiles in the onerig listing are Westpark people. A crew of nine used the call K2TOM/2 aboard the Yacht Blue Lady, cruising in the Atlantic off Sandy Hook, N. J., to take Class 2C honors with 4361 points and 298 contacts.

This is QST's lengthiest Field Day report. More scores, more photos, more soapbox, more everything. We hope every reader enjoys the info, and we extend our sincere thanks to every amateur who helped make the 1958 Field Day the greatest emergency exercise of all time!

#### Quotes

"It always seems that 101 things come up that you don't count on. We had a site not far from our homes, our fourth year there, so that we could get spares in a hurry. We spent two week ends beating down the brush and wetting down the ground so stakes for tents and guys would hold. We laid out a fire hose on account of high grass all around

It all began in early June when Texans W5FDB and W5GMV got a modest emergency-powered station going in a sort of FD warm-up. Situated at a boy scout encampment on Lake Houston, they handled much traffic. Then W5FDB recalled he had to return home for business reasons and disaster struck. As he drove away, the coax of the 50-Mc.



beam caught on the rear bumper of his truck and dragged down the beam. Not stopping there, he hauled all the equipment out of the tent and the whole caboodle went bumping along the road behind him. W5GMV chased him yelling "stop" to no avail. That's how W5FDB went mobile in a most crude and destructive manner.

The multitransmitter boys with their tons of paraphernalia have long wondered how to complete the post-FD tear-down and get home as soon as possible. Obviously W5FDB and W5GMV have solved the problem!

and, sure enough, one genny caught fire! G.I. field phones were strung between positions, which were separated as far as the rules allowed; these kept us in constant touch and hourly reporting of scores helped along competition between stations. Also, a p.a. system was available to announce chow, etc. A special plea for help in tearing down and clearing out brought additional members to the site to lend a hand when the rest of us were dog-tired. We did better than ever before but can still improve. For instance, there were points to be made on 160, and 220, 28 and 21 Mc. were not milked dry. Interlocking transmitters should be tried too. We're anxious to compare logs with other groups but some won't share their special FD secrets. Guess we wouldn't either, if we had any!" - Rio Hondo RC, K6ACF/6. . . . "Too many complications, too many gizmos. Besides the headaches of set up and equipment familiarity, we were QRT 45 minutes with a faulty t.r. witch we finally got wise to." — Manzano Mi. Moonshine & Rhombic Soc., W5EKK/5... "Excellent cooperation from the Red Cross and a fine site at the Minnesota State Fairgrounds with a Red Cross donated Bloodmobile which has its own 7.5-kw, generator." —  $W\emptyset DKI/\emptyset$ . . . . "We had good luck with W3LYP's t.r. switch ("An Electronic Transmitter-Receiver Antenna Switch," October 1957 QST) on break-in c.w." — Bayshore RC, W50IJ/5....
"Ultra-modulation proved very effective." — W6QWK/6. . . "Conditions lousy most of the night, especially on 80, and our score is far below last year. Lots of fun anyhow.' Brass Pounders ARC, W8FWQ/8. . . . "Location on high bench below summits of mountains (near Boulder, Colo.) seemed to eliminate lightning hazard as storms passed higher or lower. Suggest home stations use more care in keeping check to avoid duplicating QSOs with portables. Fixed stations usually have more convenient operating positions for this. All our dupes were made after a change of shifts; remarkably enough, no single shift duplicated a contact." - Boulder ARC, WØIA/Ø. . . . "Conditions were much worse than last year, resulting in fewer contacts even with improved equipment and antennas." — Old  $Dominion \ ARC, \ K4VLW/4...$  "Our kw. generator ran 24 hours without letup but breakdowns slowed us down. Glad to see so much activity on 6 meters." - Des Moines Tech High ARC, WØGHZ/Ø. . . . "The generator ran out of gas once and refused to start twice. A bearing froze in the final tank of the rig and we were off until we oiled it. Our score is down but a good time was had by all." -Muskingum AR Assn., W8INS/8. . . . "The gear ran perfeetly for the first time. Although we had some close competition from W7ZLC/7, 100 yards away on the same hill, very little interference was experienced."—Benson Polytechnic School ARC, W7YK/7.... "At a U. S. Forest Service tower, Fort Braden, Fla., we had to haul the Viking, two HQs and other gear up an 85-foot stairway. Must have gone up and down those steps a thousand times. W4DKT had to spend the next two days in bed. Weather perfect but nearby high-tension line made 40-meter daylight work n.g. The single-wire Windom really got out. Plenty of coffee and pop, fried chicken, few mosquitoes. A young visitor who got his toy gun tangled up in the generator governor caused an anxious minute." - W4DKT/4.

. . . "When the 120-foot tower collapsed shortly before the

start, most antennas (and interest) were lost." - Willimantic RC, W1CQO/1. . . . "The best one yet!" — Harrison Emergency Communications Assn., KØDGL/5. . . . "Enjoyed my first FD but almost broke my neck using pole-climbers to erect trap antenna. We'll be out to win next year." - K2SOL/2. . . . "Conditions poor but 20-meter vertical worked nicely and we expect to use more verticals in the future." - Blossomland AR Assn., W8MAI/8. . . . "To reduce Viking II input to 30 watts, 110 v. primary of h.v. transformer was lifted and hooked to a 5-amp Variac to control output voltage to 300 v. at 100 ma. Screen grid and bias on modulator tubes were then adjusted at this voltage to provide proper modulation." - K9DVF/9. . . . "First dry FD in years but oat bugs were a fright and breakdowns held score down. Got the sunburn of my life.  $-K\emptyset DEX/\emptyset$ ...."Our transmitter was 'manned' by mother, son and friend, a real family FD." -K9GBB/9. . . "A homebuilt s.s.b. final worked fine until it blew up. The antenna was an 80-meter doublet cut at the proper places with insulators which could be shorted for various bands. Naturally, it was strung on a rope and pulley. Power came from a 1½-kw. gas generator supplied courtesy of MARS, Lockbourne AFB." — Military and ARC of Ohio State Univ., W8LT/8. . . . "Wonder what kind of multi-

Houston Amateur Radio Club crew erects two-element 21 Mc. beam, which was on the air moments later. W5DPA/5 got 5979 points in 8A.



pliers the mosquitoes get. They had more fun than we did." W9DFV/9... "With a water tower as mast for our 8-element 50-Mc. beam, we found we couldn't transmit east until the tower got wet." - K9LFO/9. . . . "Our location was 2450 feet high and though the road up was bad, you can't stop that old ham spirit. Weather excellent for a change. When genny troubles stumped us, we contacted W3RCI in Wilkes-Barre and he got us a replacement, after which everything went FB." - Wyoming Valley ARC, W3GH/3... "Despite the flutter, conditions seemed fair. There was certainly plenty of QRM."—Carroll County AREC, K4SGI/4... "The full club membership voted, not to take part so a few of us entered for fun. Gear was borrowed and dragged to the farm of K2CTX's father. With wood ticks prevalent, aurora overhead (all N. Y. C. b.c. stations were knocked out) and the generator having fits, we still enjoyed ourselves. Hope we didn't show too badly." - Somerset Hills RC, K2ESU/2. . . . "When we got to the site early Saturday we had every intention of using multiple transmitters and making many points. One misfortune followed another, however, and we ended up with one flea-powered rig. When the equipment was fired up our 2½-kw. genny threw a rod. Luckily we had a PE-108 backup. Then the 6146 in one rig blew after three QSOs and no spare. Another fellow who tried to make a contact with his factory xmtr promptly burned out a modulator tube socket. All this before FD had even begun! All we had left by this time was the 20A s.s.b. exciter which functioned efficiently on 20 c.w. the entire 24 hours," — Alamogordo  $ARC, K\delta LRW/\delta...$  "A fine affair for the whole group. The feed line on the Windom loosened at 0300 but we had it down and back up in eight minutes. Used tent for operating and camp trailer for kitchen and sleeping, but who sleeps on FD?" - W6MTW/6. . . . "Transmitter broke down, generator had small tank which needed refilling every two hours, and gnats were thicker than hair on a hound. Then aurora hit us at midnight. Despite lowest score ever, we had a swell time and are already planning for 1959." — Sioux

Electric lift makes short work of W6UF/6 antenna upping. Here W6MUC makes last-minute adjustments to the 10-meter rotary. Eimac Gang got the second-largest Field Day contact total of 2449 with 13 rigs.





At W2GSJ/2, smiling W2SEI adjusts link on coupler as W2GSJ peaks the receiver and W2WS prepares to log on behalf of Radio Amateurs of Greater Syracuse.

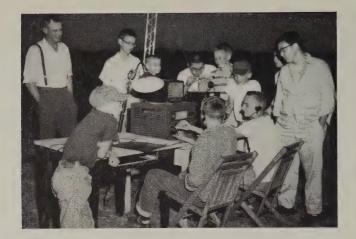
Falls ARC, WØZWY/Ø. . . . "Our site was near a favorite necking nook but we scared off the prospectors. One op zero beated and called an image for an hour - nuts to the gear!" - Ruston RC, K5NBD/5. . . . "We had an HT-32 on s.s.b. for the fellows to enjoy between shifts on the Viking. Made 90 s.s.b. QSOs too."—Cenois AR Assn., K9HGX/9. . . . "Three commercial rigs conked out and we pushed a stuck auto for 45 minutes before discovering the emergency brake was on. Despite inexperienced ops, poor antennas and malfunctioning equipment we at least made a showing. To quote an old saying, 'Wait till next year." — Mumford High School ARC, W8GMP/8....
"Many members had never been out before so we should do better in 1959. We expect to begin earlier because activity seemed to drop near the end."—Society of Radio Operators, W9NGI/9.... "Re the rules, please don't change a thing! We like everything as is. Had the time of our lives until 40 went dead." - Richmond AR Assn., W9PSD/9... "Uncontrollable generator output made receiving difficult. Future antennas will be cut to band and fed with nonresonant feed lines." - Meriden ARC, W1SBF/1... "Doing the Monday morning quarterbacking, we are at a loss to detect the reason for the poor score. Band conditions weren't good, one rig which works perfectly at home wouldn't function properly, and another did less satisfactorily than expected. All in all the weather, generators, tents and other physical facilities were good. Conelrad requirements were met by use of a b.c. set and a portable RACES transmitter-receiver unit." — W9QAB/9. .. "Despite hostile natives, ignition noise and a W8 kw. three miles away, we had a ball!"—Fremont AR Communication Engineers, K8BXD/8... "Magneto failure on power plant cut us off early."— $W\emptyset RRP/\emptyset...$  "Scoring system for FD is excellent but the system for ARRL v.h.f. contests is rotten."—Lombard 6 Meter Emergency Radio Corps, K9BDI/9. . . . "Poor conditions, xmtr and antenna trouble, and confused hams accounted for our dismal score. The local YMCA let us use a cabin with eight bunks and one bed, also their shower and freezer. This was our third year and we wouldn't miss FD for the world!" -Albert Lea Area Spider Web AR Assn., WØVEM/Ø. . . . "Would like to see the Americans look over our frequencies more, because our low power doesn't cut the mustard in the W/K phone bands." -- Moose Jaw ARC, VE5MA/5. . . . "The new Novices were amazed at the difference between copying code from a machine and on the air. Their earlier training included copying W1AW evenings but the FD QRM was something else again. Certainly a great chance for our Novice youngsters to get in there and work with the best of the m." — Hillcrest YMCA Junior RC, W8SZF/8.
... "Wx perfect, condx punko." — Order of Boiled Owls, K2FC/2... "Please don't tamper with the FD rules. Let's leave them as they are." — Elizabethtown Area Gang,

W3MFW/3. . . . "The full June moon lent a romantic atmosphere atop the Santa Monica Mountains and kept the ops going strong all night. The ever-increasing number of participating stations is most gratifying." - Crescent Bay Emergency Net, K6LDA/6... "Good operators, good equipment, good weather, horrible conditions. What a revolting development!" - W3ISE/3. . . . "The generator worked perfectly throughout and was economical in gas consumption, using less than 15 gallons in over 24 hours. It furnished power for transmitters, receivers, the coffee pot and lighting. No equipment breakdowns but plenty of operator breakdowns." — WA6AHM/6. . . . "Weather perfect with not a drop of rain for a change. Lots of FB operating but the aurora made contacts hard to come by." - Suburban Colonels, W4CVI/4. . . . "Three stations were set up but an interlock system kept the number simultaneously operated at two. We used 6.3 volt pilot lights and the auxiliary contacts on antenna relays to show the 20-meter op when 80 was active, while the 40meter rig operated alone." — Prairie Village Teenage RC, W@WWA/@... "Believe it or not, no rain!" — Friendly AR Transmitters Soc., W3QJJ/3. . . . "We had a contest with the Jefferson City club, the loser paying the bill at a banquet honoring both groups. We received good coverage in the local paper." - Daniel Boone RC, KØJAD/Ø. . "Although we had trouble with both cars in the 100-mile jaunt to our Vermont site and although it rained all day Thursday as we put up tents and although we got out like a ton of bricks until FD started and although conditions were awful during the night and although three ops fell asleep at the rigs at 0400, we still improved last year's score. Royal Order of Left-Handed Chicken Pluckers, W1DZV/1. ... "Our 7-Mc. c.w. rig was handled by new Generals on their first FD as operators. Last year they ran errands and gassed the genny."—Kokomo ARC, W9DKR/9....
"Conelrad monitor provided musical entertainment at the cooking-eating area. One fellow, returning from sleeping in his car at 0400 and greeted by a version of "The Purple People-Eater," commented that it sounded like a rock-androll session was on." — Raritan Bay RA, K20ML/2....
"We'll never use separate receiving antennas again." — Woodlawn RC, K2VTL/2. . . . "For a change the weather was ideal but evening operations were hampered by the brilliant aurora. As usual FD was lots of fun and well worth the effort. Publicity included a broadcast from the site by the local station." - Kalamazoo ARC, W8RYI/8. . . "All equipment functioned perfectly and once more all those thousands of great operators were out in force. FD is the super ARRL activity!" - W5CCH/5. . . . "Most unusual: the generator ran perfectly for 24 hours. We drove by a local club right before FD and sent some nasty words in c.w. on the horn, whereupon some ham on the tower waved his fist to return the 'good luck and best wishes.' Condx nothing special but the weather was beautiful and we doubled our 1957 score."—Cut-Throats RC, K2KFJ/2. . . "We feel that the multiplier gained by using 30 watts is not worth the extra effort. Had we sacrificed it and used 150-watt rigs, we believe we could have made up the score in more QSOs. The key clicks and phone interference encountered between our two stations seem to indicate that one rig on all bands and modes with plenty of operators might have been better." - Martinsville ARC, W9ZSK/9. ... "Six meters terrific with contacts in W2/3/7/8/9/0 and VE1 and VE3 for ten states and two provinces. Excellent QTH in Pokagon State Park, one of northern Indiana's highest points. The low-band boys said conditions and antenna troubles killed them, but during the 'red aurora' 50-Me. phone signals had almost local quality. Received publicity in form of movies taken at site and personal appearance of members afterwards on Fort Wayne's WANE-TV,"—Indiana, Michigan and Ohio V.H.F. Club & Northeastern Indiana RC, W9QWI/9. "From the standpoint of score, this was our poorest FD in recent years. But the laughs made up for it and we look toward the next one with this strong resolution: no more trap antennas."—Keystone ARC, W3PSH/3... "Never heard conditions so bad in past ten years."—Walton Ham Group, W2THO/2.... "A bang-up time, especially because this was the first year that we, the hams of Lincoln, Illinois, attempted such a project. The cooperation received from civic and c.d. officials and news and radio organs was marvelous. But without the aid of the mayor, whose son is a ham, we would never have made it. So here is our score in spite of lousy bands, poor planning, one generator mishap in which oil was added instead of gas, and a lot of tired ops

who set up three days ahead. We hope to be able to take part again. I am sure that it has spurred enough local interest to get a club and some c.d. radio emergency organization. Already a meeting has been called to discuss these matters." — W9PSL/9. . . "Very gratifying to see our Novices battle out the totally new problems of FD operation, an experience they will never forget. In spite of their low score, I rate them tops because of their persistence and hard work." - K8AJD for KN8HAS/8. . . . "Cut for the low end of the c.w. band, the 80-meter dipole wouldn't load properly in the A3 band so next year we will use two dipoles with snaps for easy, quick changing in the dark. Much fun but we are disappointed at the score. Aurora knocked us out for four hours." - Short Skip RC, W3DVB/3. . . . "Antenna trouble on low freqs, per usual. K2QLE brought his homemade telescoping 30-foot tower with halyard which made working on the long wire a cinch. Next time same deal but up 60 feet." — K2KIR/2. . . . "80 and 40 poor but quad did FB job on 20, although we need better system to eliminate repeats." - Greene ARC, W2QH/2. . . . view of the fact that we were in a cow pasture, we don't recommend that antenna installations be changed in the midnight darkness as we did. Hi!" - K9NRN/9... "No shelter but mesquite bushes and the mosquitoes and chiggers were a fright. Learned a lot in our first FD attempt." - Women Ham Operators of Texas, K5QHI/5. .. "As the years go by and the number of Field Days pile up, things seem to be getting smoother all the time. This year everything went together like a jigsaw puzzle done for the hundredth time. By using sound engineering principles for tower construction and adhering to strict safety practices, setting up the antennas was simple and the energy saved was available for contest work, catching flies, chopping wood and waking up the next relief shifts. We found the following made for a more efficient operation: all power equipment packed in wooden cases properly identified, and similar packaging of antenna equipment for easy access; floodlights for night rigging of tents, unloading of cars and trailers, and preliminary station and antenna layout; time spent prior to FD in setting up relay control and antenna-matching units paid off; each station responsible for setting up own control systems and antennas, with everyone working together on main jobs where extra effort required; excellent cooking facilities to keep the 'inner man'

"Have we worked him before or not?" wonders K5AEX, as he thumbs through the 75-meter phone log of the Kilocycle Club of Fort Worth. W5CF/5's 5658 points ranked fourth in 7A.





Novice position at Central Illinois Radio Club, W9AML/9, attracted its quota of kibitzers.

well fed." - VE2CB/2.... "Our thanks to ARRL for making FD possible. A suggestion for club secretaries: get an alphabet and numerical sample of handwriting from each operator to expedite preparation of an accurate log for submission." — Hialeah ARC, K4AA/4... "Bands poor compared to last year when we made a fair score as W1ZKE/1 from the same location. Best band seemed to be 6 meters. Unusual extended ground wave conditions on 10 meters lasted from 10 p.m. to 2 a.m." - W1HGE/1. . "Although Murphy's Law (p. 60, December 1956 QST) struck early with loss of one car and all tents, Field Day turned out well and was most enjoyable here." — Albany Park ARC, K9CDI/9. . . . "Our small, 15-man club has consistently done well in Class 1A and in 1957 moved up to win in the two-transmitter category. This time we tried 3A and found ourselves plagued by mutual interference and Murphy's Law, and undeniably outclassed by larger groups. . — Connecticut Next year, back to one rig where we belong! Wireless Assn., W1EIA/1... "We had 5000 feet of twisted-pair which we unwound into two 5000-foot sections to cut for skywires, a job that took about five hours. First FD for our club which was started about a year ago. Everyone enjoyed himself — no YLs along, darn it!" — Oxford Circle RC, K3AGX/3.... "Never thought we'd make more QSOs on 2 than 75." — Wethersfield High School ARC, W1FYF/1... "Stress importance of doing as much work on antennas and facilities at the site as far in advance of FD as possible." — Putnam County AR Assn., K2ZOG/2. . . . "We found the best way to keep the bugs from frying on hot resistors in the equipment was to unscrew the pilot lights attracting them. Whenever any kids got in the way we sent them home for a skyhook." — K9GUY/9. . . . "Although the score wasn't high, we proved that an emergency could be simulated and communications established under adverse conditions. Cedarville Forest, Md., consists of very dense timber which distorted our radiation patterns considerably. We anticipate a larger score in 1959 but feel that this is secondary to the main idea of being prepared for an emergency." — District Heights RC, W3CVE/3. . . "Rig burnt up due to removal of load from generator but we had a good picnic, an excellent new cook (VE3EIJ) and a great time." — Kingston ARC, VE3BEO/3. . . . "Trap antenna north-south and long wire east-west functioned nicely. Surprised to work KG1BB and KG1DT in warm-up period with only 20 watts." — Shoshone County ARC, W7UAK/7. . . "The halo constructed by the members worked well, being easily mounted and nondirectional. All men in the club are c.d. personnel and equipment employed would be used in time of disaster. The opportunity to try out our methods and gear was welcomed although it appeared that high-powered home stations had a definite advantage in pushing through to acquiring much higher scores." - Windhams RC, K1DJH/1 (Sorry, it ain't true. Home entries running over 150 watts must make nine times as many QSOs as a portable 30-watter to earn an equivalent tally, a feat nearly impossible in practice. — W1ZDP). . . . "Greatest troubles: generator refusing to start, and nine hours wasted trying to make a contact on a Windom with a broken feeder near the flat-top connection. Biggest goof: not sending our FD message. Publicity included plugs over

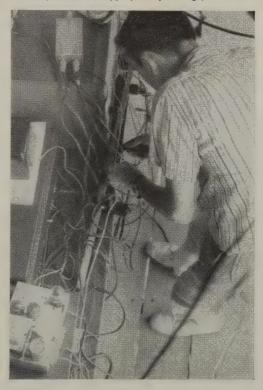
for local papers. Worst condx ever experienced but the gang was talking about next year before we had even secured the rigs." — Tube & Shutter Club, W@CVJ/Ø. . . . "Our first try and we selected an awful location amidst lots of trees and antennas proved far too low. Not enough fellows volunteered either. See you next year with better setup." Nafi ARC, K9NBK/9. . . . "FB generator and FB conditions weather and radiowise but we had crummy antennas and rotten equipment. The ops didn't amount to much either. Of course, we learned a lot and, as everyone always says, 'Wait till next year.'" — Owen County ARC, K9EOH/9. . . . "Balloon antenna worked well on 75 but collapsed after five hours. Next time we'll try cloth instead of plastic balloon."—Northeast RC, W3TYU/3... "First time in club history that FD was a complete success. Decided to gamble everything on low power and a good location at south tip of Miami Beach practically surrounded by salt water. Three DX-40s, one 310B and one Ranger assured continuous operation of three rigs. Generator was backed up by two spares which were never needed. S.w.r. meters on all antennas helped keep power into place it would do most good. Usual Florida rain came only after all antennas up and rigs operating. XYLs alternated between operating, logging and serving chow. One sad item: no one remembered to bring a camera." - Dade RC, W4NVU/4. ... "Great weather added to the enjoyment of all, although the aurora caused trouble to the boys trying to pull in that extra contact. A fine workout of our club-owned emergency equipment." — Livingston ARC, W2MO/2.... "Our site at Bull Run Mountain is near the place where the Civil War battle of the same name was fought." - ARC of Falls Church, W4PAY/4. . . . "Our new club call, which belonged to the late Cy Read, attracted much attention. OMs who couldn't believe their ears said 'W9AA????' Hamfesters RC, W9AA/9. . . . "All three stations were getting out like crazy until early morning when the bands went out. Generator purred like a kitten and the weather was fine. Improved last year's score by 300 per cent." — Mike & Key Club, K4GDL/4... "We cussed something awful when two gas generators went out until we stopped to consider what Field Day is for, to put pressure on the weak spots. Spent ten hours getting a ten-meter beam 180 feet high and not one single contact. The band never opened up here." - Old Natchez ARC, W5KHB/5. . . . "The entire exercise was a great success, especially because of the many s.s.b. contacts made. No interruptions, not even a blown fuse. Good planning paid off. If only the bands could have been open." - Naval Air ARC, W4NEK/4.... "No malfunction during the 24-hour period. Excellent coverage received in the local newspapers." — Lynchburg ARC, K4HEX/4... "One FD Hink & Hink learned was to keep the gas can away from the starting battery's terminals. While filling the generator at 0200 we had the metal nozzle of the can resting on the filler pipe of the generator's gas tank. While setting the can down it accidentally touched the anode of the battery and shorted through the can nozzle to the generator. Sparks flew! Whew! The batteries were moved." — Chiburban Radio Mobileers, K9ATM/9. . . . "Suggest that scoring consideration, given on basis of

KDEC (Decorah, Iowa) six times and presence of photogs

setup-time required, would help emphasize emergency aspect of FD." - R Assn. of Western New York, W2PPY/2. "Best ever, absolutely no trouble of any kind. Began pitching tents, antennas, etc. a full week before, and tested all gear Friday and again Saturday. Tri-band quad was especially built for FD and tower used was a trailer-type erank-up TV outfit. Swell turnout, lots of food for 75 guests at two picnic meals. Planning paid off and we are better prepared for any emergency that might arise." — Montgomery County AREC, W9VWJ/9. . . . "Boy, did they all come back to our YL operators! We did very well under the new call and even doubled last year's score." - South Side RC, K2LAK/2. . . . "Very poor. Bad aurora wiped out phone completely and six out of seven available transmitters failed in one way or another." — Chicago ARC,  $W\theta CAF/\theta$ . . . . "Low power of 50 watts or so will not compete in the lower bands any more - much different from 12 years ago. We received publicity in our local newspaper and TV coverage on Channels 4 and 9 in Oklahoma." - Enid ARC, W5HTK/5. . . . "Greatly aided by the cloudless night and near full moon when fueling the generator, also overhauling it at 0300 when it decided not to run."—K2SWI/2... "First FD for us, all between 13 and 15 years of age. A scoutmaster lent us a tent and we had saved our money for food, gas, cokes, etc. Not much sleep but heavy on the eating and operating. Within 30 minutes after end of FD, everything was cleaned up and packed and we were on our way for a shower and some - Delaware Township High School RC, W2MBC/2. . . "Although our total was considerably less than previous ones, this year was one of training for the many young operators who almost wholly staffed our positions. Our club always uses FD as a chance for emergency practice inasmuch as we are the emergency communications group for the San Fernando Valley chapter of the American Red Cross. Our entire operations were recorded in 16-mm. sound motion pictures by a member who is a professional cameraman.' San Fernando Valley RC, W6SD/6.... "Most of our participants were newcomers to ham radio. We made many mistakes but nevertheless had a good time and profited considerably from the experience. Our location was unique; we were in an underground naval gun emplacement which has been abandoned since World War II. Our 15-meter a.m. position was 60 feet underground." - Air Force ROTC ARC, KP4FAE/KP4.... "HARC took along the Halifax c.d. 40-foot trailer, 10-kw. gas plant, and 60-foot portable tower, as well as club gear, for a full workout. This was a 100 per cent trailer operation, quite a change from the cosy cabins and cottages of former years!" — Halifax ARC, VE1FO/1. . . . "Push-to-talk or voice control very important, also comfortable headphones of the proper impedance." - Boot Hill ARC, WOPMW/O. . . . "Too much emphasis on liquid refreshment and not enough on ham radio at our setup, and wonder if other clubs keep as lousy a system of logs as we do." — Pioneer RC,  $W\emptyset BGG/\emptyset$ .... "For first time all rigs were checked out ahead and the rain was holding off. Everything seemed lovely but when starting time came propagation went to pot (WWV was sending W-2) and every contact was a fight. It ate the heart right out of us for it's the second time this has happened in four years. We ate very well, probably the only factor that kept our morale up." — Detroit Metropolitan RC, W8WXN/8. . . "Importance of receipting for required FD information should be stressed. Some of the stations we worked did not wait, which caused loss of a few contacts due to missing information." — W1BY/1. . . . "We had trouble climbing a very high oak tree but after we got the 75-meter dipole up it worked fine. We didn't think the Windom would do well but we hooked Hawaii on it. Our army surplus generator, following two days of hard work on the motor, ran without a skip the whole period." — K4JGQ/4... "The aurora knocked out 14 Mc. for Stateside QSOs for nearly six hours during the night. 3.5 Mc. was hit somewhat and 7 Mc. seemed least affected but antenna feed problems held us down. Once these were licked the boys worked everything they heard, but it was too late to help our meager score to any sizable extent." - Mount Vernon ARC, K8EEN/8. . . . "Last year we had thunderstorms, year before band went dead, this year aurora. Maybe next year nature will cooperate." — South West Iowa AR Assn.,  $K\emptyset GPV/\emptyset$ . . . . "Weather perfect, our Kohler ran like a watch and mosquitoes nil, but next year we'll check for high line noise before we select a site. Thanks to increased interest and cooperation our score was 50 per cent higher." — Wheaton Community RA, K9APM/9.... The February 1958

QST ("A Three-Band Ground-Plane Antenna") job with 10-11-15-20 wire elements worked very well, even loaded on 40 meters. Please, phone stations announce your calls clearly so someone can understand them. Shades of T. O. M.!" - Grays Harbor ARC, W7TZ/7. . . . "Gang had a great time despite conditions. Ate up lots of groceries and drank lots of coffee and pop. Weather beautiful." — Green Bay Mike & Key Club, W9IKY/9. . . . "A 'Helite' camping trailer was used for the shack with excellent results. The shelf makes a good operating table with plenty of room for equipment in the storage compartment. We find that when the generator is put in a hole in the ground or in a ravine the noise decreases very much." -- WANE Television Gang. K9JKL/9. . . . "We had enough spare juice even to run the Mixmaster for the sourdough pancakes." - Electric City RC, W7ECA/7. . . . "Side-by-side operation is certainly difficult unless all cross-modulation and key clicks are eliminated." - Rogue Valley ARC, W70EK/7. . . . "Lack of advance work on antennas forced too fast setting up so had some QRM from our own harmonics." — Terry County ARC, W5HPI/5. . . . "Fine fun. We combined a picnic with an easy-going FD for a change!" - Northern New Jersey R Assn., W2DAY/2. . . . "A poor showing due to the aurora and noisy bands. Also troubled with high s.w.r. on trap antennas on c.w. end of bands, causing fuses to blow and knocking out our rig. Went after a BC548-ARC5 to fill in but when it arrived the power supply was out of commission due to jolting around. Much time lost repairing same."—Elkhart ARC, K9HDH/9...."A 3-element beam for 15 sure paid off but the bands just weren't up to par." — Walnut Hill ARC, K4IMA/4.... "It is generally felt that, in spite of technical difficulties, more stations were worked than we can furnish proof of. We suspect that some log sheets were lost during several strong wind squalls that occurred." - Baltimore ARC, W3FT/3..."Aurora caused negative results on all bands but 50 Mc. where we heard W4/5/6," — Marathon ARC,  $K \ge VKZ/2$ ... "All gear was homebrew with exception of the BC669 and HQ120X. Some difficulty from motor-generator ignition on 6 meters but a good time was

Old Dominion Amateur Radio Club maintenance man heroically strives to tidy haywire maze behind W4VLW/4's 1A setup. His call, appropriately enough, is W4TVI!





Picturesque night scene at W3ISE 3 two-rig installation features (left to right) SWL, W3BFJ, W3JEJ, W3GYL and W3DJD.

had on our first FD." - W5ICE/4. . . . "Nice weather, temperature 75°, many visitors. Poor conditions but interesting demonstration for c.d. people interested in communications." — RC de Quebec, VE2CQ/2. . . "Ops were prone to forget to log contacts properly, probably because they're away from their home environment. Never put up a tent broadside to the wind; manufacturer's claims don't hold when stacked against strong gusts."—St. Paul Mobile RC,  $W\emptyset REA/\emptyset$ . . . . "Equipment was set up and operated Friday night, all day Saturday up to beginning time, then throughout the entire 24 hours without a single breakdown. A 55-gallon gas-drum-fed generator was never shut off. Heat from the generator was used to warm another 55-gallon drum of fresh water for hot showers."—Pompton Valley RC, W2OR/2.... "Following unsuccessful attempts to raise large mast sections, it was found to be easy and quick to raise one section at a time vertically while several hams steadied the guys. This doesn't require much foresight of course, but still might save a few shiny new beams next FD." — Staten Island AR Assn., W2CWW/2. . . . "Some of our old timers have decided to admit that 2 meters has finally arrived." - Manchester RC, W1KKS/1. . . . "6 and 2 paid off when the low-freq bands were poor." - Newport County RC, W1SYE/1. . . . "Please arrange to have the 10-meter band open next year." —  $Lake\ AR$ Assn., W4YKY/4... "We don't have a brain in the club that can come up with a single suggestion to improve the event or the rules." — St. Louis ARC, KØLIR/Ø. . . "Our four tents were set up in a treeless field and we used TV and push-up masts for antennas. Site ideal for picnics, fishing and swimming as well as FD. Generator started throwing oil after two hours but W3UGX came through with another to save the day." - Harrisburg RAC, W3ZEK/3... "Aurora cut score in half." —  $Edison\ RA$   $Assn.,\ W8AW/8...$  "Freak conditions resulted in more QSOs on 50 Mc. than on any other band. A fine pot-luck dinner was served by the XYLs noon Sunday." - Grand Rapids AR Assn., WSDC/S. . . . "We found t.r.-switches were useless for break-in — real good interference generators. S.w.r. bridges with diodes also can cause noise. Plans are being made for better antennas and layouts next year. — Bloomington ARC, W9ARA/9... "How about a multiplier of 100 for all transistor rigs? Low power and good antennas are the key to success." — K2ODT/2. . . . "A good FD with no one hurt, lost, hungry or thirsty." — San Gorgonio Pass ARC, K6QYF/6. . . . "Six-meter beam made for \$1.00 on the spot paid off well for our crystalcontrolled 6-meter boys. Be sure to disconnect electric controlled 5-neter boys. It is fences within a 5-mile radius. They are real QRM-makers," fences within a 5-mile radius. They are real QRM-makers," Shelby County RC, K9GVL/9. . . . "With three spare units on hand, for the first time no power failures were experienced."—North Penn ARC, W3BTN/3...."Mobiles are valuable in c.d. work since they are completely independently-powered stations. To encourage more such activity, how about counting 1.5 points for each mobile worked?"—Fullerton RC, W6ULI/6 (Mobile activity is highly desirable, the more the better. But how could our checkers tell a mobile from a portable in a given log? — W1ZDP). . . . "Fine publicity in the newspapers. Forty visitors signed our register and there were many others, including a group of city officials. All seemed impressed by

the extensive setup, and especially by the large graveyard tent which housed two stations, cots and charcoal grills.' Paterson C. D. Emergency Group, K2MKV/2. . . . "Score terrific considering conditions and fact that the 6 and 2 meter ops were unprepared for the aurora; no power, no c.w. men and no receivers to do much." - Bedford RC, K1GAY/1... "As usual, the rain and lightning kept us from making many contacts. Our first try at s.s.b. was successful but c.w. reigned supreme as in the past with operators making more contacts per minute than on s.s.b. or a.m. We will lick mutual interference next year by using 500foot placement between positions." — Wheat Belt RC,  $K\emptyset BVX/\emptyset$ . . . "Be sure the antenna is connected to the receiver when on 'receive'; our 20-phone position had no receiving antenna for the first four hours! Another pointer: don't overfeed the help — they get sleepy." —  $Valley\ ARC$ , W7HZ/7. . . . "For 400 and 80 c.w. we have 30-watt transmitters and receivers of minimum size and good efficiency especially made for FD. Plate circuit efficiencies on the order of 70 per cent have been achieved. We hope to have more of this specialized gear available in the future." —  $Watchung\ Valley\ RC,\ W2KOJ/2.$  . . "Four 40-foot crank-up towers were loaned to us by the local highway department. We strung 108-foot doublets between them fed with 450-ohm open-wire through Matchboxes. We are sure this gave us maximum effectiveness from our 30-watt power level, since our s.w.r. measured 1:1 on all bands! Our food committee served 16 of us a 12-lb. ham (pork, not amateur), two gallons of potato salad, an enormous quantity of eggs, bread, buns, baked beans, and uncountable amounts of pop, milk and coffee. A wonderful FD!" - Marietta ARC, K8HIL/8. . . . "Formerly we had difficulty with interference because the stations were so close together, so this year we took advantage of that 1000-foot rule to spread out. We still had QRM but much, much less. It was worthwhile stringing all that power cable."—Seneca RC, W81D/8. . . . "Big grass fire, scorched tent, fire department showed up, plenty excitement."—North Peninsula Electronics Club, W6PMK/6.... "During aurora on 144 Mc. we heard W1AJR, W1FZJ, W2AMJ, W8MVN/8, W9KLR, WØSMJ. What a time for our 2-meter xmtr to be on the blink!" — Greeneville ARC, K4EWE/4. . . . "In addition to signal report and ARRL Section, how about exchanging calls of operators on key or microphone?" —  $Houston\ ARC,\ W5DPA/5,\ldots$  "The Modesto Naval Reserve Electronics Facility made available a 71/2-kw. generator, which was pulled to the site by a CAP jeep based at Castle AFB, Merced, Cal. The California State Forestry Service through its resident ranger reserved an area for our club. A Shell Oil distributor sold 50 gallons of gas to us at cost. A 50-cup electric automatic coffee maker was in constant use." - Turlock ARC, W6BXN/6. . . . "Weather balloon for 3.8-A3 was new kink. Brilliant aurora blanked out l.f. but helped 2, 6 and 10 meters." — Pioneer Valley RC, W1AEW/1. . . . "Erection and checkout of antennas the week before was a big factor in operational efficiency. 20-c.w. almost had a 50-foot tower to put the beam on but it buckled while going up. Fog that rolled in late Saturday raised heck with keys, shorting them out and causing some to be 'hot.' The XYLs did such a swell job on the chow that the cook tent was a very popular place." - West Valley

RC, K6DTA/6... "More sideband used with moderate success. Weather excellent."—Tri-County Radio Assn., W2LI/2. . . . "Better antennas than last year but bands not good. Didn't get one wink of sleep but even so could not equal my 1957 Class-B score." — W3MSR/8. . . . "Operating techniques seem to be improving but one gripe: portables that don't sign portable as required." - W6DUS/6. . . "Usual problems were met and conquered. Generator broke down, bugs attempted to eat the ops, terrific QRM, ran out of people to work, repeat QSOs, etc., but this only added to the fun." - K5DRC/5. . . . "A word to the wise: never try a Vee beam on FD. It may work well but the trouble and heartaches aren't worth it." - K2UTV/2, .. "FD has been my favorite activity since about 1935. Would a multiplier linked with time required to set up a portable station be in line with what we are trying to accomplish with FD? Might not this encourage us to have our gear ready to go in an emergency in a minimum of time? Say, one hour or less, complete installation: X 3; from one to four hours:  $\times 1\frac{1}{2}$  or 2; over 4 hours:  $\times$  1. Don't believe any change should be made without considerable thought, however, and above suggestion is no exception." — W7NQP/7..."Our 5763-5763-6146 rig at 25 watts was built especially for FD, takes five seconds to change bands. The 20-meter discone performed well enough to get 589 in KB6, and worked on 15 meters too. The 80-40 vertical raised no one until we found the coax shorted internally. The PE-75 power plant was a dog to start but just wouldn't quit once it got going. Watch out for next year's score without any breakdowns, I hope and pray!"—

K4LDR/4.... "Temperature 31° and not prepared for
the cool night. Brrrr."—W7GZN/7.... "Crummy generator blew up at 0300 Sunday morning."—K2AZJ/2. . . "Now I know why a generator gives a multiplier of 3. The feller who promised us one withdrew his offer and we ended up on commercial power." - W8FNI/8... "Even though I am a Novice I like to build gear and that's why I had only two contacts in eleven months. But I decided to work FD. I rigged up storage batteries and vibrator supplies and a 7-Mc. peanut-whistle and also fixed up my receiver for external power. I put up a tent under a tree not too far from the house and with the help of my kid brother, set up the gear. I was planning to use a balloon or kite but I couldn't get helium and the kite wouldn't go up. Used two 6V6s straight through on 7.175 Mc. for 10 watts into a pi-net. Glad to get my FD message off to SCM W2TUK."— WN2TUP/2... "Weather perfect but our spirits were dampened by the 'aurorific' signals. Wait till next year!"— RA of Eric County, W2COU/2. ... "Items in short supply were cube-taps for power

take-off, pencils, scratch paper, tent poles, can opener, matches, swim trunks, fly spray, ground rods, and large gas cans. Future need: precut center-fed dipoles for all bands." —  $K\emptyset EUD/9$ ... We demand the following multipliers: (1) 2 for having to go into an unauthorized army area to steal a light bulb at midnight; (2) 1.5 because K6SAF swiped the light undetected; (3) 10 when our trusty generator, after giving us 140 volts all evening, went up over 180 v. and blew transformers, resistors, filaments, etc. According to ARRL's incorrect method of tabulating, our score comes out 444. According to our corrected method we made 13,320 points!" - K6SAF/6. . . . "Bet I'm not in the cellar even with three QSOs. That FD message sure helps." —  $K\bar{s}GEM/\bar{s}...$  "While FDing I noticed a boat on Lake Martin, Ala., sending code with its running lights. Using a spotlight, a contact was made with K4UDI. Does this blinker QSO count in the score?" — W4HKK (Ha! — W1ZDP). . . . "Only complaints were that no one would take our message and there were not enough Novices active."  $-KN\delta QFL/\delta$ . . . "For three years I have been on FD with 20 watts or less, this time with 15. Up to 3 P.M. Saturday everything went fine, but then the high-powered boys got going. You hear a nice signal 'CQ FD,' zero your v.f.o., then a 250-watter slaps down on you and that's the end of that. The main purpose of the drill is not to see how much power one can run but to test out portable independently-powered equipment in the field. I request that ARRL make a rule that not more than 50 watts is the allowed input for all transmitters." — W6IAH/6. . . . "How about a multiplier for homebrew equipment?" -KN8HVV/8... "All gear is homebrew, including the unmatched, unbalanced 4-element beam." — K3AKR/3. ... "Watched the wrestling on TV while the bands were dead." — VE4JW/4. . . . "Generally speaking the affair was enjoyable, weather was plosh and mosquitoes light." VE2NI/2. . . . "Bands were terrible. Our two ops worked 24 straight hours and then collapsed." — K4DTI/4... "After hiring a week-end baby sitter, this XYL-OM combination went to town on FD, and our first effort in W6-land was a revelation. No storms, no bugs, warm all day and cool all night, and local stations by the bucketful. The comic relief was provided by a stable nearby. Horses were running by every few minutes and getting tangled in our ground-wire counterpoise system. By Sunday P.M. we were one exhausted family!" - K6QIK/6. . . . "Operating from the city dumps had its disadvantages and we had equipment failures, extremely heavy rains and a seven-hour drizzle, but a good time was had by all." - Miami Springs RC, K40SQ/4. . . . "We rolled out of the sack at 5 A.M. Saturday eager to call 'CQ FD.' Assembling at K6BRZ,

Right: The 50-Mc. position at K9WBT/9, Ft. Sheridan (III).

Amateur Radio Club, was in this helicopter. (U. S. Army photo)

Below: Fresno Amateur Radio Club's two stations were in an emergency trailer and a surplus bus owned by W6DVL. Joining in W6TO/6 generator conference are (from left) W6DVL, K6ZMW, W6JPS, WV6AFW and K6VLG.





we piled into a station wagon and Buick and started the long trek to South Hawkins Peak, 7782 feet up in the Angeles National Forest. The monotony of the drive was broken by continuous 2-meter operation between the two vehicles. After five stops to refill boiling radiators on the road up we arrived at the top of the world and began erecting antennas, pitching tents and getting as comfortable as possible. The generator started all right but the output fluctuated from 90 to 125 volts. After the carburetor was cleaned, the darned thing ran like a charm for the full period. At 2:00 P.M. bedlam broke loose and our receivers on 2, 6 and 15 meters sounded like every ham in the U. S. was calling CQ. We made contacts feverishly, one extra man always ready to aid in logging when a band was hot. Finally at 2:00 P.M. peace again came to South Hawkins Peak. (The generator had run out of gas at precisely the right time.) We painfully dismantled the stuff and loaded up the cars for the long drive home. Needless to say, there was little mobile work on the trip back." - Collins Radio Co. ARC, K6BRZ/6. . . . "We were testing the gear two hours before starting when the generator quit after running five minutes, but W5YLP found that beach sand made good grinding compound for the valves and had it going fast. It ran 24 hours without further difficulty too. Brazoria County ARC, K5GOI/5. . . . "Excellent luck with weather, rigs and power. Only troubles were 20 closing down and a zooming s.w.r. on one skywire. Nevertheless we'll be back with bells on in 1959." - K5GHP/5. . . . "Only advance preparation was the erecting of a 2-element 15-meter beam. We left town at 3:15 P.M. Saturday and got on the air at 4:45 after quite a tussle with the generator, a true approximation of emergency conditions."—Harlo ARC, W7TRU/7.... "Preparations began in March and a lot of 'wind' went into the next few meetings. April 20 having been chosen as a date for a trial, committees were appointed to see to antennas, power supplies and other gear. April 20 dawned with a torrential downpour unexpected and unwanted but the hardiest members proceeded to the site and by evening had become thoroughly soaked by the elements and the FD spirit. Only one rig was operated but this small start was enough to point up to the need for future preparation, and the ragchews from a portable station were a new experience. The first trial was hashed over and a new date of May 18 set for a second attempt, with the object of smoothing out the rough spots. May 18 was beautiful, serving not only to gather operating

Radiomen at Albrook Air Force Base's KZ5AF/KZ5 wound up second in the three-transmitter class with 9078 points, biggest score ever made in Canal Zone. (U.S.A.F. photo)



experience but as a picnic affair for the XYLs and Joes. A third trial June 15 gave us additional familiarity with the equipment, but now the big day was at hand. The evening of June 27 we set up camp and got the wires up, and were fully ready when the first gear arrived at 0900 Saturday. By midmorning the tent was up, the genny placed and the power leads strung. One rig was on by noon and contacts were made to see that things were functioning. We entered the FD QRM making regular QSOs and as more fellows arrived with additional gear, the second xmtr became active, this allowing one rig to be on while the second stood by. All ops worked both phone and c.w., giving each an opportunity to learn where he could do the best. The hours ticked by with appalling swiftness until we reluctantly pulled the switches to finish our first real FD. A log check indicated an average of one contact each five minutes, short of the goal but long in experience gained. All felt the score could be substantially increased in a rerun. Although we had to take things down in a pouring rain, Field Day had proved our ability to set up and operate a station under emergency conditions. See you all next year!" — Beaverton Mike & Key Club, W7ZLC/7. . . "Our station, licensed at the Des Moines County Civil Defense Training and Control Center, has access to city-owned c.d. equipment so our phone position employed their Valiant and SX-100 while c.w. used privately-owned gear. Most members are signed up for RACES and our plan is now being approved. A recently-acquired surplus USAF communications van served for our phone position with equipment temporarily installed. We intend to fix it up inside by installing operating tables, electrical wiring, antenna connections, etc. We also had a c.d. pick-up truck and a c.d. sedan at our disposal. The aurora display at 2300 ruined radio conditions and our score, but we bettered our 1957 effort by 75 contacts and got nice write-ups in the Burlington Hawk-eye  $Gazette."-Iowa-Illinois ARC, K\emptyset LDN/\emptyset.$ .. rig was in a separate 15-foot trailer house, and the entire area was lighted with three 150-watt spotlights from the beam mast. A tent was available for sleeping. Gulf of Mexico provided swimming and bathing, and fish were caught two at a time from trailer door while operating. French and American coffee was served. One op got wet when the air mattress on which he was sleeping was washed into the Gulf at high tide at 4:20 A.M." - Magic Valley RA,  $W_5LKJ/5$ .... "Good time, good wx, good beer, no luck!" — Seymour ARC, W9DES/9... "This year I was to bring only 80, 40 and 20 meter folded dipoles and nothing else. At 1300 Saturday we arrived at the location near Hamilton, Ontario, and by 1400 were ready to hook up the skywires. Imagine my consternation when I realized I had left them home, 70 miles away. There was a bug, coax, gasoline, chairs, clothes, rubber boats, sleeping bag, blankets, food - everything but the antennas. Well, you have never seen a '54 Chevy move so fast. In 3¾ hours I was back with them. As an anticlimax they fell down twice before being successfully hung, so we didn't get going until 1800 hours. For this classic boner the gang bestowed on me the much despised 'Order of the Canary Brain.' VE3FT/3 for Blackheath Cold Beer & Hot Bun Soc. . "Most unusual experience was that there were no unusual experiences. Everything functioned smoothly for a change. First year we have used dipoles instead of long wires with amazing results. A 24-hour FD with just two ops is insane but we did it anyway." - W3EMD/3. . . . "Remember to take along a first-aid kit, pillows, bug repellent or spray, plenty of liquid refreshment, and enough gas to last the night. Gas stations, we discovered, aren't open at 4:00 A.M." — W8SLR/8. . . . "What is meant by 'Skyoo skyoo (yawn) sykoo feelay'?" — K7AAW. . . . "Brother, what QRM! By the way, how about a special multiplier for the 2500 sandwiches and 32,000 cups of coffee W4CFA made? Must be some kind of record." — Orlando RC, W4PLB/4.

#### -SCORES-

#### CLASS A

Class A stations are clubs and groups in the field. Scores are tabulated according to the number of transmitters operated simultaneously at each station. The figures and letters following each call indicate the number of valid contacts, the power inputs used, the number of participants

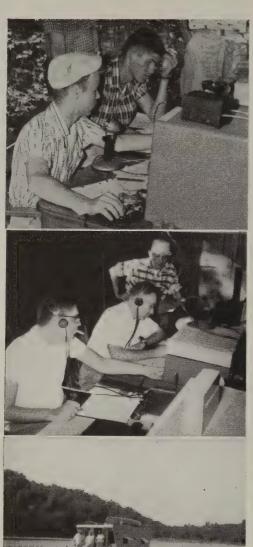
at each station and the final score. The "power classification" used in computing the score is indicated by the letters A, B or C after the number of QSOs shown. A indicates power up to and including 30 watts (multiplier of 3); B indicates power over 30, up to and including 150 watts (multiplier of 2); C indicates over 150 watts (multiplier of 1).

W5EKK/5	One Transmitter  Manzano Mt. Moon-			
KH6RS/KH6 WØDKI/Ø	shine & Rhombic Soc. Maui ARC  American Red Cross of	685 <b>-</b> 588-	A- 8- A-20-	6534 5517
	St. Paul	409- 320-	A- 6- A-30-	$\frac{3906}{3105}$ $\frac{3027}{3027}$
W6QFK/6 W7OTV/7 K5GOI/5 KH6EN/KH6 KH6LM/KH6	Tualatin Valley ARC Brazoria County ARC.	421- 464-	AB-24- B- 7-	2940
KH6EN/KH6 KH6LM/KH6	Happy Hawaiians (nonclub group) Bayshore RC (nonclub group) (nonclub group)	326- 294-	A-10- A- 6-	2934 2871 2853
W50IJ/5 W8DJN/8	(nonclub group)	317- 289-	A-12- A- 6- A- 4-	$\frac{2855}{2826}$
W4SUD/4	Owensboro ARC	268- 436- 404-	B-31- B-11-	2616 2574
W6BLY/6	(nonclub group) Owensboro ARC Lafayette ARC Whittier Radio 50 Club (nonclub group)	245-	A-10- B-10-	2430
WØANV/Ø		398- 259- 258-	A- 4- A- 6-	2388 2331 2322
KH6LM/KH6 W50IJ/5 W8DJN/8 WØDEP/Ø W4SUD/4 W5DDL/5 W6BLY/6 W7LHM/7 WØANV/Ø W6QWK/6 W3RVC/3	(nonclub group) Allegheny-Kiski AR Assn			2292
W4ACA/4 W9ONB/9 W9NWX/Ø W8FWQ/8 W7LRA/7 W8NCF/8 W4DIJ/4	Assn	357- 375- 225-	B- 3- A- 4-	$2250 \\ 2250 \\ 2250$
WØNWX/Ø W8FWQ/8	Newton RC Brass Pounders ARC	225-	A-12- A- 6- A- 6-	2142
W7LRA/7 W8NCF/8	(nonelub group) Newton RC Brass Pounders ARC Utah ARC Tusco RC (nonelub group)	211-210-	A-18-	2124 2115 2106
W4DIJ/4 W4LLO/4	(nonclub group) Key West ARC (nonclub group) Massilon ARC Boulder ARC (nonclub group) Mid-South AR Assn	209- 208-	A- 4- A-10-	2097
W4DIJ/4 W4LLO/4 W7YEY/7 K8APE/8	Massillon ARC	208- 231- 318-	A- 4- A-11-	2097 2079 2058
W9YIT'/9	(nonclub group)	315- 312-	B- 3-	2040 2022 2016
KH6AQL/KH6	Hilo ARC	199- 310-	B_13~	2016 2010
W5USN/5 W0RT/0	(nonclub group)	303- 280- 297-	B- 9- AB- 6- B- 3-	$\frac{1968}{1953}$
W4EM/4 KH6AQL/KH6 K4VLW/4 W5USN/5 WØRT/Ø W6IFZ/6 WØGHZ/Ø	old Dominion ARC. (nonelub group). (nonelub group). Richmond RC Des Moines Tech High RC. Albany ARC. (nonelub group). Tupelo ARC. Muskingum AR Assn. Canton ARC. Niagara Frontier DX Assn.			1932
	Albany ARC	292- 286-	B-13- B-21-	1926 1866
K4ICW/4 K6IUM/6 K5PEO/5 W8INS/8	Tupelo ARC	181- 278-	A- 4- B-17-	1854 1818 1800
W8RTR/8	Canton ARC	300- 173-	B- 6- A-29-	1782
K2FQ/2	Assn	295- 260-	B- 7- B- 6-	1770 1710
W7YK/7 W9NZ/9 VE3FT/3	Assn  Benson Polytechnic ARC SWANI ARC Blackheath Cold Beer &	190-	A-10-	1710
	Hot Bun Propagation	161-	A- 4- A- 5-	1674
W5PIM/5 W7ZLC/7	Soc. (nonclub group)	156-		1629
K9DVF/9 W4VOZ/4 W7JKB/7 W2NLQ/2 W4DKT/4 W6KSW/6 W1CQO/1 W4M1/4 VEZEE/2 K7AIA/7 W9EPT/9 KØDGL/5	Club	271- 154- 179-	B-12- A-11-	1626 $1611$ $1587$
W4VOZ/4 W7JKB/7	(nonclub group)	239- 205-	B- 7-	1584 1581
W2NLQ/2 W4DKT/4 W6KSW/6	(nonclub group) (nonclub group)	961	AB- 8- B- 7- AB- 3- B- 5- B- 3- AB-12-	1566 1566
W1CQO/1 W4MI/4	(nonclub group). Willimantic RC. Tuscaloosa ARC. Canadair Ltd. ARC.	235- 237- 232-	AB-12- B- 5-	$1551 \\ 1542$
VE2EE/2 K7AIA/7	Canadair Ltd. ARC Santiam RC	144- 230-	B- 5- A- 5- B- 8- A-13-	$\begin{array}{c} 1539 \\ 1530 \\ 1521 \end{array}$
W9EPT/9 KØDGL/5	Santiam RC	144-		
W2QW/2	Communications Assu	225- 142-	AB- 7- A- 4- AB- 5- A- 4-	1515 1503 1497
W2QW/2 K2SOL/2 W5OVX/5 W4AB/4 W8VQI/8	(nonclub group) (nonclub group) Broward ARC Buckeye Shortwave Radio Asen	248- 138- 218-	A- 4- B-20-	1467 1458
W8VQI/8	Buckeye Shortwave Ra-			1458
W6YR/6. W8MAI/8	dio Assn	183- 213- 231-	B- 6- AB- 7- B-10- B-16-	$\frac{1455}{1434}$
W8MAI/8 K8BTP/8 W5NNI/5 K5NNI/5 K4DPD/4	Quaker Radio Assn Sabine Valley ARC	229-	B-16- B- 8- A- 4-	$\frac{1386}{1374}$
K5GHP/5 W4DPD/4	(nonclub group) Lake Wales ARC	152- 199-	B-19-	1368 1344
W4DPD/4 W2APH/2 W2GSJ/2 W7VPA/7	(nonclub group) RA of Greater Syracuse	148-	A- 4- AB- 4-	1332
W7VPA/7 W9CDO/9	Mossomiand AR Assii  Sabine Valley ARC  (nonclub group)  Lake Wales ARC  (nonclub group)  RA of Greater Syracuse  Richland ARC  Electron Club  Central Buckeye AR.	219- 197-A	B- 8- ABC-12-	1314 1311
W8SGT/8	Winons ARC	435- 216-	C-11- B-12-	$\frac{1305}{1296}$
WØIIK/Ø K8CKU/8 W7IXH/7	(nonclub group)	143- 179-	A- 6- B- 5-	1296 $1287$ $1224$
W9JMN/9	Oconto County AR Assn	177-	B- 6-	1212
W2TIO/2 KØDEX/Ø W7TRU/7 W4WQT/4	Oconto County AR ASSI. (nonclub group) (nonclub group) Harlo RC Tenn-Tucky ARC (cheraw RA League Wantagh RC Mason County RC	130-	A- 9- B- 6-	1170 1152
W7TRU/7 W4WQT/4 K4KGR/4	Tenn-Tucky ARC	162- 161- 161-	B- 8- AB- 8- B-10-	1134 1122 1122 1116
K4KGR/4 K2BCI/2 K8DXF/8	Wantagh RC Mason County RC	99-	A-10-	1116
K9GBB/9 W8LT/8	(nonclub group) Military & ARC of Ohio	99-	B-12- A- 3-	1116
W5DSZ/5	(nonclub group) Military & ARC of Ohio State Univ Caravan Club of Louisi-	160-	AB- 7-	1113
W7WUC/7	Catalina RC	159- 157- 157-	B-10- B- 6- B- 5-	1104 1092
W9DFV/9	(nonclub group)	157-	B- 5-	1092



Plenty of swimming, sunning and sailing between QSOs at W1BB/1, situated on the pier at the Winthrop (Mass.) Yacht Club.

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K9LFO/9 W8SYX/8 W2PET/2 W7SO/7 K7AUO/7	(nonclub group) Six Meter Nomads	95-	A- 3- B-10-	1080
W851A/8 W9DFT/9	(nonelub group)	179- 132-	AB- 4-	$\frac{1074}{1068}$
W780/7	Albany ARC	176-	AB- 4- B- 7-	1056
K7AUO/7	Tektronix Employees'			.,,,,,
	(nonclub group)	174-	B- 9-	1044
W9MAK/9	(nonclub group)	149-	B- 7-	1044
W7SSF/7	Dutte ARC	147-	B-15-	1032
KØITZ/Ø	Nodaway Valley R	1.477	70 m	1000
TYPATETTES /A	Nodaway Valley R ASSN Ancient City ARC Providence R ASSN Wyoming Valley ARC Dartmouth ARC Lakeland AR Soc. Sugar Creek ARC Carroll County AREC Blue Ridge ARC Firestone Band-Jammers RC Somerset Hills RC Rolla AR Campus RC (nonelub group) North Canton ARC Aero ARC RC of Leavenworth Senior High School.	147-	B- 7- B- 9-	1032
W4UHC/4	Providence P Asser	145~ 113-	A	1020
W10P/1 W3GH/3	Wyoming Velley ARC	88-	A- 8-	1017 1017
VEIDN/I W4BOW/4	Dartmouth AR('	98-	A- 6-	1017
W4BOW/4	Lakeland AR Soc.	241-	B-10-	1014
KOMMA/O	Sugar Creek ARC	167-	B- 7-	1002
K4SGI/4 W4NYK/4 W6GED/6	Carroll County AREC.	138~	B- 7- B- 4-	$\frac{978}{972}$
W4NYK/4	Blue Ridge ARC	162~	B	972
W6GED/6	Firestone Band-Jam-	100	** *	0.00
TERRICITY (O	mers RC	133~	B- 4-	960
K2ESU/2	Somerset Hills RC	81-	A- 4- B- 4-	$\frac{954}{942}$
WØEDA/Ø WØYI/Ø VE2JB/2 K8JTC/8	Compus BC	157- 125-	AB- 5-	936
VE21B/2	(nonelub group)	125-	В- 3-	912
KSITC/8	North Canton ARC	100-	A- 7-	900
W3PGA/3	Aero ARC	149-	B	894
W3PGA/3 WØYVY/Ø	RC of Leavenworth Se-			
	nior High School	148- 122-	B- 8-	888
KØGDW/Ø K8INN/8	Kaw Blue RC	122-	B- 8- B-18-	882
K8INN/8	Kaw Blue RC. Oshtemo Amat. Six Me-			
**************************************	ter Club	94-	A	846
K5LRW/5 W6MTW/6	Alamogordo ARC	94-		846 840
WØIO/Ø	Chonclub group)	140-	B- 0-	830
W 910/ 9	ARC'	140-	B- 9-	840
WØZWY/Ø	Sioux Falls ARC	140-	B-16-	840 840
K5NBD/5	Ruston RC	137-	B- 8-	822
K9HGX/9	Cenois AR Assn	137-	B-20-	822
W9ZTN/9	Allison ARC	134-	B-15-	804
W7ROX/7	Gallatin ARC	129-	B- 9- B- 4-	774 768
W 9ZW 1/9 K5NBD/5 K9HGX/9 W9ZTN/9 W7ROX/7 W4OWV/4 W8GMP/8	Alamogordo ARC (nonclub group) State Univ. of Iowa ARC Sloux Falls ARC Ruston RC Cenois AR Assn. Allison ARC Gallatin ARC (nonclub group) Mumford High School ARC	101-	B- 4-	768
W8GMP/8	Mumford High School	128-	B-13-	768
WØBMM/Ø	ARC. O.B.P. *1 ARC. Boys' Club of St. Marys	127-		762
W3KYR/3	Boys' Club of St. Marvs	121-	D- 4-	102
11 31L 1 1C/ 0	AR Soc	81-	A- 4-	729
VE2CO/2	AR Soc.  Lakeshore Field Day Group. (nonclub group). Society R Operators.			
	Group	56-	A- 3-	729
K2QDI/2	(nonclub group)	120-	B- 5-	720 720
W9NGI/9	Society R Operators	220-	AC-15-	720
W9NGI/9 W8VHY/8 W8YKV/8 W8ODJ/8	(nonclub group) Buckeye Shortwave R	119-	B- 3- B- 8-	714 714
W8YKV/8	Duelrove Chortwove P	119-	D- 3-	114
W8ODJ/8	buckeye Shortwave K	113-	B-15-	678
W7ROO/7	Assn (nonclub) group (nonclub group)	107~	B= 4=	642
W7RQQ/7 K7AUV/7	(nonclub group)	107-	B- 4- B- 4-	642
W 9PS D / 9	Richmond AR Assn	107~	B- 4- C- 7-	$\frac{642}{627}$
W8SLR/8	(nonclub group)	209-	C- 7-	627
W8SLR/8 W9TBY/9 KØEMR/Ø W3CDI/3	Richmond AR Assn (nonclub group) Neenah-Menasha ARC.	104-	B-10-	624
KØEMR/Ø	Wansie R.C.	79-	B- 9-	624
W3CD1/3	Baltimore Polytechnic	103-	D E	618
13767ST/6	Mitaball BAC	77-	B- 5-	612
WOLVC/9	TVIRC	101~	B- 5- B- 6-	606
W3EXW/3	Etna RC	98-	B-11-	544
KØJOO/Ø	Crete ARC	96-	B- 4-	576
W1FKJ/1	(nonclub group)	70-	B- 3-	570
W8TQK/8	Barry AR Assn	91-	B	546
KØGVG/Ø	Clinton ARC	157-	C-14-	546
WISBF/I	Midway PC	54- 53-	A-14- A- 4-	486 477
WØZSJ/Ø W9LVC/9 W3EXW/3 KØJOQ/Ø W1FKJ/1 W8TQK/8 KØGVG/Ø W1SBF/1 W9QAB/9 K8BXD/8	Fremont AR Communi-	00-	/1- 1-	211
NoDAD/o	Baltimore Polytechnic Institute RC Mitchell RAC Mitchell RAC TVI RC Etna RC (rete ARC (nonclub group) Barry AR Assn. (linton ARC Meriden ARC Midway RC Fremont AR Communication Engineers. (nonclub group).	51-	A- 4-	459
W6NAD/6	(nonclub group)	74-	B- 4- C- 3-	444
K9CUI/9	(nonelub group)	142-	C- 3-	426
W6NAD/6 K9CUI/9 W1FCE/1 K6VWF/6	(nonclub group)	69-	A R. Q.	414
K6VWF/6	(nonclub group)	49-	AB- 4- B- 5- B- 10-	393
	cation Engineers (nonclub group) (nonclub group) (nonclub group) (nonclub group) Tri-State AR Soc (nonclub group)	65-	B- 5- B-10-	390 390
WØRRP/Ø WØVLF/Ø	(nonclub group) Story County AREC	65- 37-	AB-10-	390
1191111/9	Deorg Councy Market,	0,-	2220 20.	0.70









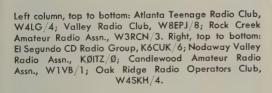


Left column, top to bottom: Hampton Roads Radio Club, K4UYT/4; Seneca Radio Club, W8ID/8; Johnson County Radio Amateur Club, WØLPA/Mobile; Cathay Amateur Radio Club, W6MFI/6. Right, top to bottom: W7JKB/7; W5YFN/5; Muskingum Amateur Radio Assn., W8INS/8.







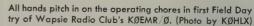














K8GJW/8 W7FIO/7 K9BDI/9	Cleveland VHF RC Dallas ARC Lombard Six Meter Emergency Radio	64-	B- 8-	384
W7FIO/7	Dallas ARC	63-	B- 5-	378
K9BD1/9	Lombard Six Meter			
	Corps. Albert Lea Area Spider Web AR Assn. Newton ARC Oswego County AR Assn Lima Area ARC.	42-	A- 6-	378
WØVEM/Ø	Albert Lea Area Spider			3/8
	Web AR Assn	27- 39-	AB- 8-	360
WØWER/Ø W2UMI/2 W8EQ/8 W7MRW/7	Newton ARC	39-	AB- 8- A-12-	351
W2UM1/2	Oswego County AR Assn Lima Area ARC Newberg ARC Lower Yakima Valley RA	58-	B- 6-	348
W7MRW/7	Newborg APC	58- 56-	B-10- B- 8-	
W7MRW/7 W7BCZ/7	Lower Vakima Valley	90-	D- 8-	336
	RA. (nonclub group) Fairmont RC Porterville ARC Southern Alberta ARC. (nonclub group)	53-	В	318
K5BYA/5 WØNQK/Ø W6QXF/6 VE6PF/6 K9CAH/9 VE5MA/5 VE3DBT/3 VE1IZ/1 W8SZF/8 W4GQK/4 W9TGM/9	(nonclub group)	52- 52-	B- 7- B- 8-	318 312 312
WUNQK/U	Fairmont RC	52-	B- 8-	312
WOQAF/O VEGPE/6	Southorn Alborto ABC	50-	B~ ~	300
K9CAH/9	(nonclub group)	48- 42-	B-10- B	288 252
VE5MA/5	(nonclub group) Moose Jaw ARC	40-	B	234
VE3DBT/3	(nonclub group) (nonclub group) Hillcrest YMCA Jr. RC Cartersville ARC	25-	A- 3-	240 225 222
VEIIZ/1	(nonclub group)	66-	A- 3- B-10-	222
W8SZF/8	Hillcrest YMCA Jr. RC	200-	B-12-	200
WOTCM/0	North Control Indiana	33~	B- 3-	198
W 01 CM1/ 0	North Central Indiana	85-	B-10-	170
KØKYD/Ø WISAD/I K9DXB/9 KN8ITD/8 KN1DAI/I	ARC (nonclub group) (nonclub group) Sullivan County RAC (	24-	B-10- B- 3-	170 136 126 123
W1SAD/1	(nonclub group)	14-	A- 4-	126
K9DXB/9	Sullivan County RAC	41-	C	123
KN8LLD/8	(nonclub group)	19-	B	114
KN1DA1/1		10	AB- 3-	111
K8BFF/8	21011000	13- 12- 15-	AB- 3- A- 4-	108
K9EEC/9	(nonclub group)	15-	A- 5-	90
K8BFF/8 K9EEC/9 KN8HAS/8	(nonclub group)	9-	A- /-	87 76 72 50
K4JFZ/4	(nonclub group)	38-	B- 3-	76
KNORQM/0	(nonclub group)	8-	A- 1-	72
W1COL/1	(nonelub group)	25- 4-	B- 3- A- 3-	36
KN8HAS/8 K4JFZ/4 KN6RQM/6 KN5MHU/5 W1COL/1 K1HDZ/1	St. Joseph High RC. (nonclub group). (nonclub group). (nonclub group). Porterville ARC Novices (nonclub group). (nonclub group). Witch City RC.  Transmitters Congreted Steep	4-	A	36
Two	Transmitters Operated Simu	Itanao	10721	00
TZ9TECL/9				
K2FC/2 W3MFW/3	Order of Boiled Owls	700-	A-12-	6525
	Elizabethtown Area Gang Ramey ARC Night Owl Net Crescent Bay Emer- gency Net (nonclub group) Mike & Key Club Bandhopper's RC (nonclub group) Mike & Key Club Bandhopper's RC (nonclub group) Palmetto RAC Irvington RAC Hampton Roads RC Candlewood AR Assn. RA of Eric County (nonclub group) (nonclub group)	593-	A-11-	5569
KP4WV/KP4	Ramey ARC	583-	A-18-	5472
KP4WV/KP4 K2KGB/2 K6LDA/6	Night Owl Net	593- 583- 577-	A-18- A-11-	5562 5472 5418
K6LDA/6	Crescent Bay Emer-			
WRISE /2	gency Net	541- 507-	A-21- A-10- A-10-	5094
W2IQ/2	(nonclub group)	500-	A-10-	$\frac{4788}{4725}$
W6JVA/6	Mike & Key Club	438-	A- 8-	4635
WØRFU/Ø	Bandhopper's RC	551-	AB-11-	4635 4272
W9ERU/9	(nonclub group)	435-	A- 6- AB- 4-	4140
WaGQB/6	(nonclub group)	578- 614-	AB- 4-	4140 4077 3834
W2ODP/2	Irvington PAC	407-	B-16-	3834
K4UYT/4	Hampton Roads RC	596-	A-32- B-20-	$\frac{3663}{3576}$
W1VB/1	Candlewood AR Assn.	568-	B-16-	3558
W2COU/2	RA of Erie County	367-	A-12-	3528
WA6AHM/6	(nonclub group)	387-	A- 6-	3483
KADMU/4	(nonclub group)	576-	B-16-	3456
W4CVI/4	Suburban Colonels	367- 387- 576- 474- 568-	AB- 7- B- 7-	3444 3408
W4ZV/4	Richmond ARC.	567-	B-30-	3402
W31SE/3 W21Q/2 W5JVA/6 W9LFFL/Ø W9ERD/9 W5GQB/9 W4MN/4 W2ODP/2 K4UYT/4 W2COU/2 W4GAHM/6 K4BMC/4 K6KDF/6 W4CV1/4 W9CV1/4 W9CV1/4	(nonclub group) (nonclub group) (nonclub group) Suburban Colonels Richmond ARC Prairie Village Teenage			
WY2OTT /2	RC.	413-	AB- 9-	3375
W3QJJ/3	RC Friendly AR Transmit- ters Soc. Daytona Beach AR Assn Miami Springs RC. MARS Group. Fresno ARC. Central Iowa ARC Tippecanoe AR Assn. Bartlesville ARC. Stockton ARC.	560-	B-10-	3360
K4PFN/4	Daytona Beach AR Assn	534-	B-12-	3354 3282 3276 3078
K4OSQ/4	Miami Springs RC	534- 522-	B-12- B-15-	3282
K5USA/5	MARS Group	546- 513- 315-	B- 4~	3276
W6TO/6	Fresno ARC	513-	B-40-	3078
WOREG/O	Tippegenoe AP Assn	315-	A-10- AB-12-	3069 2994
W5NS/5	Bartlesville ARC	464- 473-	B-30-	2994
W6SF/6	Stockton ARC	469-	B-12-	2964
KØJAD/Ø	Daniel Boone RC	385-	B-12- AB-15-	2940
W2ODV/2	Bartlesville ARC. Stockton ARC. Daniel Boone RC. Bayonne CD ARC. Canal Zone AR Assn. Meridian ARC. West Phila. R Assn. AR Assn of Bremerton. Royal Order of Left.	485-	B-15-	2910
W5EO/5	Meridian ARC	460-	B-11-	2910
W3MKA/3	West Phila R Assp	479- 416-	B-15- AB-20-	2874
W7VE/7	AR Assn of Bremerton	433-	B- 6-	2874 2826 2754
K4PFN/4 K4OSQ/4 K5USA/5 W6TO/6 W6LGC/6 W9REG/9 W5NS/5 W6SF/6 K6JAD/6 W2ODV/2 KZ5JW/KZ5 W3FW/5 W3FW/5 W3FW/5 W3FW/7 W1DZV/1	Royal Order of Left-	_00		-101
	Handed Chicken Pluck-	0.00		
K4IVI/4	North Augusta Balva	279-	A- 3-	2736
	ers	275-	A-14-	2700
KØLDN/Ø W9AB/9 W3YIW/3 K8KLI/8	Iowa-Illinois ARC	275- 450- 298- 382-	B-22-	$\begin{array}{c} 2700 \\ 2700 \\ 2682 \end{array}$
W9AB/9	Michiana ARC	298-	A-11-	2682
W3XIW/3	(nonclub group)	382-	AB- 8-	2562 2520
TYOU T11/9	Kanawha RC	393-	B-25-	2520

0/5 0/5 1/5 1/5 3/8 R/9 L/2 L/2 L/2 V/3 5/2 9 V/3 5/3	Pittsburg County ARC. Fort Smith ARC. Magie Valley RA. The DX Club. Ford AR League. Kokomo ARC. (nonclub group). Raritan Bay RA. Woodlawn RC. Arlzona ARC. (nonclub group). Gensie group). Heladelphia Wireless Assn. Cut-Throats RC.	419- 418- 412- 407- 405- 308- 2347- 259- 381- 223- 373- 218- 435-	B- 8- B-15- B-22- AB-20- A- 6- AB-12- A-40- B-6- A-13-	- 2508 - 2472 - 2442 - 2436 - 2366 - 2330 - 2304 - 2238 - 2238 - 2238
V/3 F/5 H/5 H/3	Tri-Town ARC Friendship ARC (nonclub group) (nonclub group) Philadelphia Wireless	215- 435- 249- 226- 352-	AB-25- AB- 6- B- 4-	
/2 2/5 5/2		201-	A-10- A- 5- B-10-	
M/9 /6 /Ø /4 /4 // /9 \$/4 :/9	(nonclub group)  Slide Mountain VHF Club Milwaukee RAC (nonclub group) Orlando RC Kinston AR Soe. Jayhawk AR Soe. Jayhawk AR Soe. Jayhawk AR C Peninsula ARC Peninsula ARC Ind. Mich. and Ohio VHF Club & Northeastern Ind. RC Waterbury ARC Keystone ARC Waiton Ham Group Dit Happy Dash Hounds Pleasant Valley ARC (nonclub groups) Forest City RC Channel Communications Club (nonclub group) Lake Charles High School Short Skip RC Rappahannock Valley RC (nonclub group) Jackson RC	230- 244- 313- 433- 325- 318- 308- 181- 281-	A- 5- AB-15- AB BC-10- B- 9- AB-20- A-15- B-25-	2016 1997 1950 1908 1857 1854
/1 /3 D/2 L/3 L/6 /9 E/8 E/5	eastern Ind. RC. Waterbury ARC Keystone ARC. Waiton Ham Group. Dit Happy Dash Hounds Pleasant Valley ARC. (nonclub groups) Forest City RC. Channel Communica-	283- 381- 208- 203- 304- 278- 271- 259-	B-22- AC-18- AB- 6- A- 6- B-10- B- 7- B- 8- AB-12-	1830 1827 1824 1818 1776 1767
J/Ø /5 5/3 4	tions Club (nonclub group) Lake Charles High School Short Skip RC Rappahannock Valley	291- 263- 264- 285-	B-14- B- 8- B- 3- B-10-	1746 1740 1734 1716
/4 4 /3 /2 /3 2 /9	Rappahannock Valley RC (nonclub group) Jackson RC Horseshoe RC (nonclub group). Mercer County R Assn. Greene ARC (nonclub group) MacDill MARS Club Milford ARC YLs of San Francisco Butler County VHF Assn Lawrence ARC (nonclub group). Andrews County ARC AR Transmitting Soc. Bloomfield RC.	255- 259- 197- 282- 254- 161- 278- 159- 516- 269- 211-	B-10- B- 3- AB-20- B-18- B- 5- A-25- B- 6- A- 3- C-30- B-14- AB- 7-	1710 1704 1701 1692 1868 1674 1668 1656 1623 1614
7.1 /6 /8 /0 /1 /5 4 /8 9	Butler County VHF Assn Lawrence ARC (nonelub group) Andrews County ARC AR Transmitting Soc. Bloomfield RC Raysan RC Warren AR Assn. Door County ARC Sarasota AR Assn. Nevada AR Assn. Tulare County ARC Fort Myers ARC Fort Myers ARC Fort Myers ARC North Pittsburgh Brass Pounders & Gum Beaters Hialeah ARC Mecklenburg AR Soc. Charleston ARC Cuyahoga Falls RC Women Ham Operators of Tarrant County Gratio County AR Assn.	147- 254- 172- 232- 229- 169- 160- 248- 222- 221- 242-	AB-7- A-14- AB-11- AB-3- B-7- B-25- A-8- AB-11- B-8- -7- B-11- B-13-	1614 1572 1566 1551 1542 1542 1524 1521 1491 1488 1482 1476 1452
5 9 /3 6 6	women Ham Operators of Texas. (nonclub group) Pottstown AR Assn. Tulare County ARC. Fort Myers ARC. North Pittsburgh Brass	215- 159- 236- 236- 206-	B- 9- A- 3- B B-10- B- 6-	1440 1431 1416 1416 1392
74 74 8 5	Pounders & Gum Beaters Hialeah ARC Mecklenburg AR Soc. Charleston ARC Cuyahoga Falls RC Women Ham Operators	163- 198- 224- 196- 221-	AB- 5- AB-12- B B- 7- B-18-	1353 1353 1334 1326 1326
8	of Tarrant County Gratiot County AR	194-	B- 7-	
/3 3 /9 [/3 1 /1 )	Racine Megacycle Club Algoma ARC Southington AR Assn. (nonclub group) Albany Park ARC	190~	B-20- B- 5- AB-15- B-25- B- 8- AB-12- A-14- B- 6-	1314 1296 1293 1290 1278 1227 1224 1182
7 9 5 5 3 5 7 5	Jasper High School RC. (nonclub group). Arkansas Valley ARC. Galveston County ARC The Thirteen ARC. East Bay ARC.	195- 129- 166- 166- 187- 162- 98- 96-	B-12- B- 9- A- 8- AB- 4- B- 8- B-20- B- 9- A- 6- A-11-	1182 1176 1170 1161 1152 1146 1122 1122 1107
8	Muskegon Area AR	240- ]	BC-25-	1101
3	Fairfield High School	367- 182-	B-18-	1101 1092
3 /7	Oxford Circle RC Cenla ARC Fraser Valley ARC	182- 153- 178- 130-	B-10- B- 3-	$1080 \\ 1068 \\ 1062$

W9VTI/9 W3GUR/ W6ASV/ W4KC/4 W3ZWZ/

K4AA/4 W4BFB/ W4HHO, W8VPV/ K5LZW/

W3NAV/ K3ERL/X W9UDU/ VE3CKV W1ECV/ W1HGE/ K9CDI/9 K7CCH// W9OUS/Y W3DJL/3 K5PXP/X W5KMK, VE7SE/7 W6CUS/6 K6ER/6 W8NZ/8

KØBPR/Ø

W9OYR/9 K3CSF/3 K9CAS/9	Mancorad RC Regular Fellows ARC Claphrook High School	149- 174-	B- 7- B- 8-	1056 1044
K3AAF/3 WØUOX/Ø W5ABF/5 W2SW/2 K2YNT/2 WØIQW/Ø VEIIM// W2ZRX/VOI VESHCD/3 K4DXZ/4 W5IYN/5 K5JZZ/5 W9CFS/9 K4JRU/4	Glenbrook High School Electronies Club (nonclub group) Redwood Falls ARC Mineral Wells ARC Sunrise RC Metuchen Y RC Rochester ARC (nonclub group) Pepperrell ARC Sarnia Civil Defense Valley ARC Tyler ARC (nonclub group)	90- 147- 314-	A- 7- B- 5- C-20-	1035 1032 1020
W5ABF/5 W2SV/2	Mineral Wells ARC Sunrise RC	144- 123-	A-12- AB-14-	1014 993
K2YNT/2 WØIQW/Ø	Rochester ARC	89- 137-	AB-10- B-28-	991 984
W2ZRX/V01	Pepperrell ARC	134- 131- 157- 76-	B- 9- B-15-	954 942 942
K4DXZ/4 W5IVN/5	Valley ARC	76- 126-	B- 5 A- 4- B-20-	909 906
K5JZZ/5 W9CFS/9	(nonclub group)	151- 112-	B- 5- AB-15-	906 855
K4JRU/4 W3VV/3	Warner Robins ARC McKean County RC	141- 140-	B- 7- B-12-	846 840
K4JRU/4 W3VV/3 W8KS/8 W1FYF/1	Point RA Warner Robins ARC McKean County RC (nonclub group). Wethersfield High School ARC	92-	A- 4-	828
K4OFZ/4	Wethersneid High School ARC Edisto ARC Melody Hill ARC Sequoia ARC St. Johns RC Mt. Pleasant ARC (nonclub groun)	110- 135- 89-	AB- 3- B- 5- A- 5- B- 9-	822 810 801
K40FZ/4 K2YKV/2 K6QEZ/6 VE2APX/2 W8PHU/8	Sequoia ARC	107- 84-	B- 9-	792
	Mt. Pleasant ARC (nonclub group)		A B-11- A- 5-	756 738 729
K2BJP/2 K5NCP/5	(nonclub group) USNR Electronics	118-	A- 5- B- 5-	714
K2ZOG/2	Mt. Pleasant ARC (nonclub group) (nonclub group) USNR Electronics Facility Putnam County AR Assn.	180-	BC	714
W3ZRB/3	Clearfield County RC	116- 113- 86-	B- 6- B- 5- AB-10-	$696 \\ 678 \\ 672$
WØERH/Ø W3CYU/3	Assn. County AR Assn. Clearfield County RC. Johnson County RAC. Warren County Emergency R Assn. & Corry RC. Central Illinois RC. Stratford ARC.		20-10-	012
W9AML/9	RC Central Illinois RC	111- 197- 87-	B-12- BC-27-	$\frac{666}{657}$
W9AML/9 VE3SCD/3 W1EH/1	Claubh I wood Door Chaw	87-	AB- 8-	657
WOTWM/0	der & Propagation Soc Kishwaukee RC	624- 194-	C- 9- BC-13-	649
W9TWM/9 K9GUY/9 K2DUR/2	(nonclub group)	77- 66-	B- 4- A- 7- AB- 4- A- 4- AB- 9- AB- 3- B	624 612 594
K2DUR/2 K9EAI/9 W7GJQ/7	Grant County RC	54- 124-	AB- 4- A- 4-	594 576 450
W3CVE/3 K2VSR/2	District Heights RC Troy High ARC	54- 51-	AB- 9- AB- 3-	$\frac{441}{426}$
W7GJQ/7 W3CVE/3 K2VSR/2 W8NC/8 K8DAA/8	Grant County RC (nonclub group) District Heights RC Troy High ARC Sandusky Valley ARC. Holland Area RC Central Alberta Radio	69- 44-	B B-12-	414 414
V E0QE/0	Central Alberta Radio League. (nonclub group) Kingston ARC. Richmond ARC. Shoshone County ARC. Homesteader RC. Windhams RC. Tarmetto ARC. (nonclub group) Naples ARC. Pelham Bay RC. Greenbelt AR Assn. Elmira AR Assn.	69- 66-	B B- 5-	414 396
K2ESM/2 VE3BEO/3 W8ZJJ/8	Kingston ARC	49- 42-	4 YO 1 F	
W7UAK/7 KØCIU/Ø	Shoshone County ARC. Homesteader RC	35- 50-	A- 6- B- 8-	315 300
VE3BEO/3 W8ZJJ/8 W7UAK/7 KØCĮU/Ø K1DJH/1 W4NUN/4 VE6TP/6 K4YHB/4 W2WNA/2 K3CEZ/3 W9ZL/2	Windhams RC Tarmetto ARC	31- 135-	AB-15- AB- 6- B- 8- A- 5- B- 4- AB- 3- BC- 7- B- 3- B- 5- A-18-	$\frac{279}{270}$
VE6TP/6 K4YHB/4	(nonclub group)	43- 152- 35-	AB- 3- BC- 7-	$\frac{267}{252}$ $\frac{210}{210}$
W2WNA/2 K3CEZ/3 W2ZI/2	Greenbelt AR Assn	34- 92-	B- 5- A-18-	204 184
WØCVJ/Ø WIWOM/1	Elmira AR Assn Tube & Shutter Club Port City ARC Geneva AR Assn	26- 21-	B-10-	156
W2ZJ/2 WØCVJ/Ø W1WQM/1 W8DVA/8 K9NBK/9	Geneva AR Assn Nafi ARC Owen County ARC		A- 5- B- 3- B- 4-	144 60
Three	Transmitters Operated Sim	1- ultaneo	usly	6
W4FU/8 KZ5AF/KZ5	Ohio Valley AR Assn (nonclub group)	1081- 1215-	A-15- AB-18-	$\frac{9954}{9078}$
W4FU/8 KZ5AF/KZ5 W6MHM/6 W1EIA/1	Bell Gardens AR Assn	810-	A-16-	7515
W6NWG/6	Assn. Palomar RC	843- 775- 999-	AB-18- A AB-21-	7506 6975 6849
W8CZM/8 W3NKF/3	Connecticut Wireless Assal. Palomar RC Northeast RC West Park Radiops Naval Research Lab. ARC Dade RC Crescenta Valley RC Livingston ARC Pasadena RC Delaware-Lehigh ARC	966-	AB-39-	6645
W4NVU/4	ARCDade RC	707- 627-	A-11- A-20-	$6588 \\ 5904$
W6JU/6 W2MO/2	Crescenta Valley RC Livingston ARC	619- 717- 610-	A-27- AB-15- A-16-	5805 5766 5715
W6KA/6 W3OK/3	Delaware-Lehigh ARC.	624- 594-		5616
K6CIZ/6	Hughes ARC Aerojet RAC Baton Rouge RAC	668- 575- 543-	AB-30- A-14-	5571 5250 5175
K6QEH/6 K6CIZ/6 W5KC/5 W2UBW/2 W3RDM/3	Mid-Island RC York Road RC Oak Ridge R Ops. Club.		A-10~	0130
W 45IXII/ T	Oak Ridge R Ops, Club. (nonclub group)	824- 590-	AB- 8-	5076 4944 4731
W6IJK/6 W4PAY/4	(nonclub group) Aerojet ARC ARC of Falls Church Hamfesters RC	701- 527- 624-	AB-16- AB-20-	4731 4629
W6IJK/6 W4PAY/4 W9AA/9 W3ATR/3	Hamfesters RC Beacon RA	624- 703- 533-	AB-12- AB-11- AB-12-	4446
W1DMI/1 W2QYV/2 W4GNF/4	Niagara RC	451- 711-	A =2()=	4359 4322 4266
W1DDD/1	Beacon RA El Ray ARC Niagara RC Greensboro RC Blackstone Valley ARC Oklahoma City ARC Alexander Hamilton High School RC	553- 643-	AB-13- AB-20-	4266 4182 4164
W5GU/5 K6CXI/6	Alexander Hamilton High School RC		A-14-	4131
K4GDL/4 W7REP/7 K6YJL/6 K2KCE/2 W4CVY/4 W4TRC/4	High School RC Mike & Key Club Skagit ARC RA Mobile Soc Lockport A R Assn	600- 433- 630-	AB-10- A- 8- B-19-	4128 4122 4110
K2KCE/2 W4CVV/4	Lockport AR Assn	630- 449- 650-	AB-30- B-31-	4053 4050
	Kingsport ARC Old Natchez ARC	624- 591-	B-29- AB-15-	3900
W5MUZ/5 K4JVA/4 W4NEK/4	Lockport AR Assn. Columbus ARC. Kingsport ARC. Old Natchez ARC. Ouachita Valley ARC. South Miami RC. Naval Air ARC. ARC. of the Univ. of	400- 602-	A-15- B-22-	$\frac{3825}{3792}$
W4NEK/4 W5YM/5		601-	AB-12- B-15-	3765
	Arkansas	027-	D=10=	0102

6BRZ/6	Collins ARC	385-	A- 4-	3762
V2GLQ/2 V2GLO/2	Nutley ARC	377-	A- 4- A-20- AB-23-	3618
V6SNK/6	Bay Cities ARC & San-	040-	AD*20*	3003
	ta Monica City Col-	272	A 15	2500
V2GBY/2 V5BJU/5 V4HEX/4 V4MEG/4	lege RC (nonclub group) (nonclub group) (gulf Area YL AR Klub Lynchburg AR C. Kyana RC Lorain County AR Assn Vancouver ARC Los Alamos ARC (nonclub group)	373- 368-	A-15- A- 5-	$\frac{3582}{3537}$
K5BJU/5	Gulf Area YL AR Klub.	368- 559-	A- 5- B-10-	3537 3504
V4MEG/4	Kyana RC	583- 551-	B-36- B-35-	3498 3456
V8MAX/8	Lorain County AR Assn	514-	AB-15-	3402 3375
V4MEG/4 V8MAX/8 VE7ARV/7 V5PDO/5 V9STW/9 V5TSV/5 V6DWG/6 V7NTO/7 V5PAA/5	Vancouver ARC	514- 478- 457-	AB-15- AB-13- AB-12- AB- 7- AB-15- A-20-	3375 3366
V9STW/9	(nonclub group)	391-	AB- 7-	3360
V5TSV/5	Pampa ARC	481-	AB-15-	3360 3303
V6DWG/6 V7NTO/7	Lewis County ARC	342- 340-	A-20- A-15-	$\frac{3303}{3285}$
V5PAA/5	Ios Alamos ARC (nonclub group) Pampa ARC Sylvania ARC Lewis County ARC Aeronautical Center			
Z0.4.TPM /0	Chiburban P. Mobilears	489- 519-	AB-40- AB- 4-	$\frac{3222}{3222}$
V5TAK/5	Jackson ARC	412-	AB-18-	3159
X9ATM/9 V5TAK/5 V6LZ/6 X7AAH/7 V2PPY/9	Poinsettia RC	412- 467- 442-	AB-19-	3063
V2PPV/2	R Assn of Western N Y	474-	AB-10- AB-25-	3063 3060
VØERG/Ø	Sioux City ARC	474- 476- 489-	AB-14-	
V3WJD/3	Springfield ARC	489- 286-	AB-14- B- 6- A-22-	2934
V4CB/4	Danville ARC	377- 388-	AB-10-	2763
V3VPR/3	Anne Arundel RC.	388- 364-	AB- 9- AB-13-	2706
V2FPY/2 VØERG/Ø V3WJD/3 V8NCM/8 V4CB/4 V3VPR/3 V5CBW/5 V5FC/5 Z6IDI/6	Dallas ARC	401-	B-3()-	2562
X6JDL/6 X9WBT/9 V1JFK/1	Mojave Desert ARC	259- 336-	A- 9- AB-45-	$\frac{2556}{2523}$
X9WBT/9 W1TEK/1	Tri-City AR Council	366-	AB-45- AB- 8-	2523
X4JIY/4	Aiken ARC	366- 317-	AB-16-	2451 2433
X4JIY/4 V6UJ/6 V9VWJ/9	(nonclub group)	284-	AB- 4-	2403
V 9 V W J/ 9	Lewis County ARC Aeronautical Center ARC Chiburban R Mobileers Jackson ARC Poinsettia RC McChord ARC R Assn. of Western N.Y. Sloux City ARC Delco RC Springfield ARC Danville ARC Anne Arundel RC Two Meter MARS Club Dallas ARC Mojave Desert ARC Ft. Sheridan ARC Tri-City AR Council ARC ARC Montgomery County Montgomery County Montgomery County Chicago R Traffic Assn. Oklahoma A & M Tech. AR Assn. BB Brain RC.	374-	B- 6-	2394
K4WBG/4 W9MSG/9 K5ISK/5	(nonclub group)	369- 233-	B- 6- B A- 9-	2376
W9MSG/9 K5ISK/5	Oklahoma A & M Tech.	233-		
	AR ASSI.  BB Brain RC Quinebaug Valley RC. (nonclub group) South Side RC Rockaway Valley RC Chicago ARC Enid ARC St. Patroshurg ARC	356-	B- 3- A-12- AB-12-	2310 2286 2259 2247
W6CBH/6 W1BRF/1 W3NA/3	Ouinehaug Valley RC	254- 328-	A-12- AB-12-	2286 2259
W3NA/3	(nonclub group)	297-	AB- 5-	2247
K2LAK/2	South Side RC	303~	AB-15-	2232 2214
W9CAF/9	Chicago ARC	293- 249-	AB-42- AB-15-	2157 2148
W5HTK/5	Enid ARC	358- 356-	B-16-	2148
W4GAC/4 W1VXL/1	Enid ARC. St. Petersburg ARC. Cranston AR Assn. (nonclub group) Northern Nassau ARC. (nonclub group) group)	260-	A B-18-	2136 2115 2061
KICOV/I	(nonclub group)	229-	AB-15- AB-15- AB- 5-	2061
X2TAZ/2	Northern Nassau ARC.	288- 260-	AB-15-	2046
K8EIJ/8	(nonclub group)	246-	AB- 5- AB-10-	2031 2013
W3NĀ/3 K2LAK/2 K2LAB/2 W9CAF/9 W5HTK/5 W4GAC/4 W1VXL/1 K1COV/1 K2TAZ/2 K2SW1/2 K8ELJ/8 W1JT/1	East Providence AR	309-	B-10-	2010
K2LSA/2	State Line RC	302- 222- 329-	A = 1.5=	1998 1974
W8MMI/8	Niles ARC	329-	B-14-	
K2LSA/2 W8MMI/8 W2MAU/2 W1EUH/1	Pinhead Net	288~ 314-	AB- 7- B-11- B-15	1944 1884
K4ALI/4 K6EMN/6 W3RSC/3 W6MIX/6	Assn. State Line RC Niles ARC Syracuse VHF Club Pinhead Net Pensacola ARC Pan American RC Allband R Klub	314- 314-		1884 1872
K6EMN/6	Pan American RC	238- 266-	AB- 9- AB- 7-	1872
W6MIX/6	El Dorado County ARC	279-	AB-12-	1845
W6MLK/6	High Frequency Ama-	290-	AB- 7-	1836
W9MJL/9	Allband R Klub El Dorado County ARC High Frequency Ama- teur Mobile Soc Vermilion County AR	302-	B-20-	1812
W2MBC/2	Delaware Township	229-		
W8RLT/8	High School RC	258-	AB-30-	1803
K2RKO/2	Livonia RCLivingston High School RCCoffee Dunkers of De-	199-	A	1791
W8AM/8	Coffee Dunkers of De- troit	272-	B-10-	1782 1766
K5LRU/5 W7NBR/7	troit	564-	B-10- BC-28- B-17-	1766
W7NBR/7 W6SD/6	San Fernando Vallev RC	241-	AB-20-	1746 1743
X9CQA/9	Spokane RA	241- 246- 288-	AB-18-	1740
W7NBR/7 W6SD/6 X9CQA/9 W5ES/5 W8QO/8	El Paso ARC Teceumseh ARC	288- 288-	AB-20- AB-18- B-25- B	1728

Halifax Amateur Radio Club, VE1FO/1 (VE1IF keying)





Chicago Suburban Radio Assn., W9SW/9

W2BVL/2 W8CRR/8 WØFLN/9	Nassau RC Scioto Valley ARC St. Louis University	246- AB- 8- 1722 260- B-20- 1710
W5IU/5 W8ACW/8 W1NBN/1 KP4FAE/KP4	ARC Kerrville RC Genesee County RC	259- B- 7- 1704 279- AB-12- 1701 283- B 1698
WINBN/1 KP4FAE/KP4 VE1FO/1	ARC Kertville RC Genesee County RC Merrimack Valley ARC Alr Force ROTC ARC Hallfax ARC Black Hills ARC Middlesex ARC Abliene ARC	212- AB 1644 266- B-16- 1596 150- A-14- 1593
VEIFO/I WØIWE/Ø W1HEB/I W5QA/Y	Black Hills ARC Middlesex ARC Abilene ARC	150- A-22- 1575 217- AB-11- 1566 260- B-21- 1560
W1HEB/1 W5QA/5 WØPMW/Ø WØBGG/Ø W7SUI/7 W8QIH/8	Middlesex ARC. Abilene ARC. Boot Hill ARC. Ploneer RC. (nonclub group) Walnut Hills High School RC. Rock Hills ARC.	230- B-15- 1530 194- AB-18- 1518 227- B- 7- 1512
K4YTZ/4	School RC	179- AC- 4- 1482 202- A 1461 137- A- 3- 1458 226- AB-18- 1446
K6HS/6 W1LAM/1 K2GRE/2 W8WXN/8	Rock Hills ARC (nonclub group) . Bristol County R Assn Glen Cove RC Detroit Metropolitan	160- A-12- 1440
W7FTO/7	Apple City BC	198- AB-10- 1437 214- B-12- 1434 229- AB- 4- 1419
W1BY/1 W3FZC/3 W1BB/1	(nonclub group). MIC ARC. Winthrop Emergency R Net. Air Capitol AR Assn.	220- AC-11- 1410 165- AB-20- 1383
KØCTT/Ø W9GFD/9 VE3DC/3 W5ABB/5	Prairie ARC	230- B-20- 1380 212- AB-20- 1374 206- B-16- 1236
W2SEX/2	Air Capitol AR Assn. Prairie ARC. Hamilton ARC. Del Rio ARC. AR Assn. of the Tonawandas. Walpole AR Assn. Rahway High School RC Mid-Hudson RC.	201- B- 8- 1356 200- B-20- 1350 132- A 2 1322
W1YFA/1 K2MYY/2 W2HIP/2 K4JGQ/4	Rahway High School RC Mid-Hudson RC	200- B-20- 1350 122- A- 3- 1323 169- AB-15- 1305 166- AB- 7- 1299 215- B- 3- 1290 213- B- 1270
K4JGQ/4 KØDLS/Ø VE3SRC/3 K8EEN/8	(nonclub group)	166- AB-11- 1269
K8EEN/8 VE3YJ/3 W7HMK/7 KØGPV/Ø	(nonclub group). (nonclub group). (nonclub group). Scarborough ARC. Mt. Vernon ARC. London ARC. Central Oregon RA. Southwest Iowa AR Assn.	133- AB-10- 1242 171- AB-11- 1224
W9JIY/9	Central Indiana Mobile	175- B-16- 1200 172- B-15- 1182
W6KJF/6 K2KED/2 W6BML/6 K9APM/9	Far West RC  Burlington County RC.  Mt. Shasta ARC  Wheaton Community	172- B-15- 1182 171- B- 8- 1176 182- AB-16- 1173 194- B-12- 1164
W4SB/4 VE2ADX/2	Tidewater Mobile RC South Shore ARC	168- B-11- 1158 297-ABC-16- 1146 168- AB-12- 1143
VE2ADX/2 K3CSG/3 W7TZ/7 W9IKY/9	Grays Harbor ARC	120- A 1080 154- B-16- 1074
VETRO /7	Totem ARC	167- AB-17- 1059 152- AB- 4- 1044 114- A- 4- 1026
WEIBQA KØHLA/Ø W2EB/2 W4BKT/4 W9EJC/9 WØUAN/Ø K3DBE/3 WØDRC/Ø	Tri-County ARC Miami County RC.	113- A-10- 1017 167- B- 9- 1002 153- AB-14- 990
WØUAN/Ø K3DBE/3	(nonclub group)	109- A- 4- 981 154- B-12- 924
KIHOA/I K9IKL/9	Reading & Woburn RC. WANE Television Gang	151- B- 9- 906 100- A- 7- 900 173- AB- 4- 846 279- C-12- 837
W7ECA/7 W3ZIC/3	Electric City RC Fort Venango Mike & Key Club	279- C-12- 837 136- B-15- 816
W8EPJ/8 W8FY/8 W7OEK/7 W2IQT/2	Squaw Island ARC Tri-County ARC Miami County RC (nonclub group) All quippa Area RA Assn Tri-State R Soc. Reading & Woburn RC WANE Television Gang Electric City RC Fort Venango Mike & Key Club Valley RC Van Wert ARC Rogue Valley ARC (nonclub group)	111- AB- 6- 807 128- B 768 101- AB- 8- 762
W9BOM/9	(nonclub group) Kenosha R Communi- cations Soc	124- B-12- 744
KØIIK/Ø VE7WO/7 W5HPI/5 K2YOU/2	cations Soc.  Three Rivers ARC Point Grey ARC Terry County ARC Ulster County Mike & Key Club Norwalk AREC	122- B-12- 732 97- B-7- 732 121- B-16- 726
W1SGZ/1	Key Club	85- AB-20- 675 112-ABC- 6- 669

K1BOS/1	Southwick CD Radio Group	74-	A- 5-	666
W2DAY/2 K9HDH/9	Northern New Jersey Radio Assn	47-	A-10- ABC-11-	648
K4IMA/4 K2IBC/2	Walnut Hill ARC	230- 101-	AB- 4- B- 6-	630 627 606
K4IMA/4 K2IBC/2 WØTWU/Ø KØAXU/Ø	Southwick CD Radio Group. Northern New Jersey Radio Assn. Flkhart ARC Walnut Hill ARC Avenel RC McPherson ARC Northwest St. Louis ARC.	138	ABC- 3-	558
K6KHZ/6	Tehama County ARC.	241- 88-	B-16- B- 9- AB-14-	532 528 522
W3FT/3 W1ZLH/1	Tehama County ARC. Baltimore ARC. Middlebury Mike &	83- 121-		
WØZOU/Ø K8DDD/8	Key Club	86-	AB B- 7-	
W1VTJ/1		82- 73-	B-15- AB- 7- B- 5-	492 483
K2VKZ/2 W5ICE/4	Marathon ARC	76- 26- 50-	AB-15- B- 6-	456 456 450
W1VTJ/1 K1AET/1 K2VKZ/2 W5ICE/4 W3HZW/3 W9DES/9	Kent County ARC Seymour ARC	132- 218-	BC-14- B-13-	441
WØEGG/Ø	RC of Quebec	110-	A-14- B- 6- B-10-	405 396
W9DES/9 VE2CQ/2 WØEGG/Ø WØWFD/Ø W3DUI/3 W2CWR/2	(nonclub group) (nonclub group) Marathon ARC (nonclub group) Kent County ARC Seymour ARC RC of Quebec Hastings ARC Coffeyville ARC Hazleton ARC Amateur VHF Institute of N. Y. Windom AR Soc. Tu-Boro RC (nonclub group) Tuolumne AR Soc.	66- 49-	AB-10-	396 369
	of N. Y Windom AR Soc	151- 54- 82-	AB-10- B-14-	$\frac{345}{324}$ $\frac{321}{321}$
W2BMW/3 KN9IZK/9 WN6UKT/6	(nonclub group)	82- 23- 36-	A-15-	321 288
KØHND/Ø W2BMW/3 KN9IZK/9 WN6UKT/6 K9ELE/9 VE2UB/2	Winslow AR Soc St. Maurice Valley AR	92-	B- 6- AB- 4- B- 5-	288 258 234
	AssnCentral Queens RC	39- 27- 28-	B-12- AB-16-	234 210
WA2AHY/2 WØREA/Ø K8ESE/8	(nonclub group) Tuolumne AR Soc. Winslow AR Soc. St. Maurice Valley AR Assn. Central Queens RC. St. Paul Mobile RC. (nonclub group)	28- 26-	AB- 6- B- 8-	195 156
Four 2	Transmitters Operated Simi	ultaneo	usly	1 001
W2OYH/2 W2OR/2 W9PCS/9 W9PCS/9 W6JBT/6 W2CWW/2 W6LRT/6 W3NEW/3 W2OIC/2 K6LTA/6 W3NEW/3 WYOIC/2 K6LTA/6 WTAW/7 K2PQL/2 WSTO/8 W4THM/4 W3JNQ/3	Pompton Valley RC	1133-	A-21-1 AB-50-1 A-10- A-15- AB-22- AB-14- B-15- AB-25-	0,212
W6JBT/6 K6ACF/6	Citrus Belt ARC	931- 777-	A-15- A-15-	8379
W2CWW/2 W6LRT/6	Staten Island AR Assn. North Bay AR Assn.	744- 804-	AB-15- AB-14-	6372
W3NEW/3 W2OIC/2	Capitol Suburban RC Larkfield ARC	901- 776-		
K6LTA/6 W7AW/7	Beachwood AR Klub West Seattle ARC	556- 744-	A- 6-	5229
WSTO/8	Columbus AR Assn	665- 632-		4485
W3JNQ/3 W64EX/6	Frankford RC	1063-	BC-17-	2070
K6SIR/6 W4HCB/4	Ramona RC	544- 500-	A-32- AB-28- B-17-	3960 3792 3744
W4THM/4 W3JNQ/3 W6AEX/6 K6SIR/6 W4HCB/4 W1KKS/1 W4HFH/4	Manchester RC	382- 549-	AB-42- AB-15-	3507 3480
K6CUK/6	Morris RC Morris RC York RC York RC Citrus Belt ARC Rio Hondo RC Robert RC Reachwood AR Ksin Rio Hondo RC Reachwood AR Kinb West Seattle ARC Rethpage ARC Robert RC	475-	AB-15-	3459
WISYE/1	Newport County RC.	382- 534-	AB-25- B-22-	3339 3204
W3KOU/3 W1SYE/1 W5MS/5 W4YKY/4 W3AD/3	Lake AR Assn	397-	ABC-18- AB-38-	3135 3069
W7RGL/7	ting Soc North Kitsap ARC	329- 365-	AB-30- AB-10-	3066 3021
W6MFI/6 KØOKI/Ø K6IIV/6	Cathay ARC Kansas City ARC	393- 484-	AB- B-25-	3021 2910 2904
K6IIV/6	Southern California VHF RC	297-	A- 8- A-12-	2898
W9DUP/9 VE3AIS/3	Oakville ARC	286- 279-		2808 2736
W10SA/1 K9AV0/9 K2MQW/2	Western Electric ARC.	406-	B-20- AB-17- AB-17- BC-35- AB-17-	2652 2625
W4LG/4 KØLIR/Ø	Atlanta Teenage RC	527-	BC-35-	2592 2505 2433
W3ZEK/3 W4MQN/4	Harrisburg RAC	403-	D=44=	2418 2277 2250
VEIAEP/1 W6LFJ/6	Sydney ARC Sonoma County RAC	225- 249-	AB-16- A-12- A-10-	2241
E2MQW/2 W4LG/4 K9LIR.0 W3ZEK/3 W4MQN/4 VELAEP/1 W6LF1/6 W60UI/0 W8AW/8 VE3BSQ/3 W9LCA/9 W4EFR/4 W4NEP/4	Denver RC Edison RA Assn	307- 319-	AB-10- AB-12-	$\frac{2193}{2124}$
W9LCA/9	Chicagoland Mobile RC	329- 292-	A B-18-	$\frac{2109}{2085}$
W4NEP/4 W8TZO/8 W1GDH/1	Paducah ARC	314- 296-	AB- 8- B-20- AB-25- AB- 9-	$2028 \\ 1950 \\ 1935$
	Assn	305-	AB-12-	
W8SZN/8 W8DC/8	Assn 20/9 RC. Grand Rapids AR Assn. Bloomington ARC.	266- 284-	B- 8- B	1896 1746 1704
W9ARA/9 W6UCS/6		262- 301-	B-23- AB-10-	1704 1572 1556
W3LLR/3	RA Megacycle Soc Pocono AR Klub	229- 200-	B-16- AB-17-	$\frac{1530}{1488}$
W4HBB/4 W3SAV/3	Pocono AR Klub Kennehoochee ARC Savannah ARC Nittany Valley ARC Decatur ARC Tuolumne AR Soc.	218- 212- 187-	BC-11- B-15-	1386 1308
W4LEN/4 W6ALL/6	Decatur ARCTuolumne AR Soc.	187- 208-	AB-10- B-20- B-18-	1308 1284 1272 1248
K2ODT/2 K6QYF/6	(nonclub group)	189- 151-	B-18- AB- 9- AB-15-	$\frac{1245}{1239}$
W9ARA/9 W6UCS/6 K9CJU/9 W3LLR/3 W4BT1/4 W4HBB/4 W3SAY/3 W4LEN/4 W6ALL/6 K2ODT/2 K6QYF/6 W1MB/1 W4MIK/4	Prince William County	159-	AB-14-	1233
W9UC/9 W7LAB/7	Fort Wayne RC	254- 199-	BC- 6- B-12- B-37-	1221 1194
W9UC/9 W7LAB/7 W1CLO/1 W1HQH/1	noulume Ak Soc. (nonclub group). San Gorgonio Pass ARC Satuit ARC. Prince William County AREC. Fort Wayne RC. Ogden ARC. Podunk ARC. Cape Cod & Islands AR Assn. St. Croix Valley RC.	172- 181-	B-37- AB-15-	1182 1158
VE1PF/1 K9ENM/9	AR Assn St. Croix Valley RC	174- 94-	AB-21- A-10-	1149 1134
K9ENM/9 W8FO/8	AR Assn St. Croix Valley RC Pontiac RC Toledo RC	94- 132- 180-	A-10- AB-26- B-40-	1086 1080

K6ENK/6 K9GVL/9 K8DAC/8	Camellia Capital Chirps Shelby County RC Saginaw Valley AR	168- B- 7- 1008 166- B-15- 996
K1WAS/1	Assn	163- B-10- 978
WEDHC/E	MARS Club	146-ABC- 7- 924 103- AB-10- 912
W2SZ/2 WØZRT/Ø W8NAE/8 K2BKO/2	RPI RC	185-ABC-16- 858 143- B-13- 858 127- B-10- 762
W8NAE/8 K2BKO/2	Thumb ARC	127- B-10- 762 118- B- 9- 708
K2DIE/2	Cowanesque Canisteo	93- AB-11- 645
W8SDW/8 K5PPZ/5	AR Assn	90- B- 8- 540 74- A-10- 444 81- BC- 7- 399
K5PPZ/5 WØIBB/Ø W3CTG/3	(nonclub group) Morristown High School	
***************************************	ARC	62- B- 8- 372
	Transmitters Operated Simu	
K6BAG/6 K6BF/6	Pacifico RC Santa Barbara ARC	1298- AB-10-11,823 1211- A-19-11,124 1153- AB-20- 8754
W6PMI/6 W2YKQ/2	Lake Success RC	976- AB-22- 8298
W2YKQ/2 W3BTN/3 W6CX/6	United RAC. Lake Success RC. North Penn ARC Mt. Diablo ARC. Wright-Patter on Com-	892- AB-30- 5769 614- A-26- 5769
K8AIR/8	Wright-Patter on Com- municators Club	903- AB-35- 5850
K6IL/6 K9AVE/9 W6ULI/6 W1SKT/1	numeators Club  Newport AR + oc  Illinois Valley R Assn.  Fullerton RC  Narragansett Assn. of	555- A-52- 5220 542- A-20- 5130
W6ULI/6 W1SKT/1	Fullerton RC Narragansett Assn. of	659- AB-12- 5106
K6CVF/6	Radio Operators Bandspanners ARC Westside ARC Paterson CD Emergency	624- AB-35- 4767 648- AB-14- 4593
$\frac{\mathrm{W5ABD}/\mathrm{5}}{\mathrm{K2MKV}/\mathrm{2}}$	Westside ARC Paterson CD Emergency	705- B-16- 4380
	Group	696- B-15- 4176 669- B-10- 4164
W7YYE/7 K1GAY/1 K6FAV/6 K5AXA/5	Bedford RC	565- AB-15- 3906 491- AB-20- 3834
K5AXA/5 W2ZQ/2	San Angelo ARC Delaware Valley R	526- AB-20- 3822
K6OWL/6	Assn	554- AB-32- 3789 576- AB-19- 3756
VE3JJ/3	West Side RC of To-	375- A-18- 3600
W6DGO/6	Imperial Beach RC	538- AB- 6- 3525
KØHT/Ø W4VTA/4 W1SEA/1	Montrose County ARC Confederate Signal Corps Wilmington CD RC	350- A-17- 3150 485- B-10- 3072 419-ABC-14- 3051
W3RQZ/3		431- AB-25- 2988
K5QHD/5	Garland ARC	390- AB- 5- 2961 453- B-15- 2868 428- AB-21- 2865
W1SEA/1 W3RQZ/3 W3IIC/3 K5QHD/5 W1TKA/2 K5OCT/5 VE7EZ/7	Cumberland Valley ARC Garland ARC Stamford ARC Santa Fe RC Victoria Short Wave Club	389- B-11- 2484
	Club	384- B-32- 2454 232- A-10- 2313
K6CKQ/6 W7DP/7 W1AQ/1	Mt. View ARC Walla Walla Valley RAC Assn. RA of Southern	232- A-10- 2313 342- B-16- 2202
		303- AB-20- 2190
W3CAB/3 K6EAG/6 WØRZT/Ø	Washington RC. Hayward RC. Mississippi Valley RC.	281- AB- 8- 2053 272- AB-12- 2040
W0RZT/0 W6PML/6 W1GES/1	Santa Maria RC	310- B-16- 1860 261- AB-10- 1782
WIORS/I	Santa Maria RC North Shore R Assn Stratford ARC	234- AB-14- 1689 240- A-15- 1551
KØBVX/Ø W4NPT/4	Wheat Belt RC Faetulant ARC	237- B-24- 1422 200- AB-11- 1386
KØBVX/Ø W4NPT/4 KL7AA/KL7 W3UEN/3	Stratford ARC	190- B-10- 1290
WØEQU/Ø	23.100	215-ABC 1245 202- B-16- 1212
W8EMG/8 W1VPU/1	Ak Sar Ben RC Blennerhassett ARC Shelton Emergency R	175- AB 1077
W1BIM/1	Assn	140- AB-16- 915
K8ATI/8	AR Assn Tri-County AR Assn	136-ABC- 9- 843 109- AB-14- 666
	Transmitters Operated Simu	
K2AA/2	South Jersey R Assn	1474- A-80-13,401 1163- A-41-10,467
W7HZ/7 W2KOJ/2	Watchung Valley RC Chicago Suburban R	1163- A-41-10,467 969- A-42- 8946
W9SW/9	Assn	736- A-45- 6849 607- A-50- 5688
W9SWQ/9 K6AGF/6 KH6WO/KH6	Assn. Four Lakes ARC. Tri-County AR Assn. Honolulu ARC. Westchester AR Assn.	607- A-50- 5688 602- A-35- 5418 797- B-23- 4944
W211B / 1	Westchester AR Assn.	709- B-29- 4254
W80L0/8 W2US/2 W1NEM/1	Gentile MARS Group Suffolk County RC	648- AB-42- 4137 620- B-21- 3720
		355- A- 6- 3420 391- AB-20- 3309
W1MHL/1 K8HIL/8	ASSI Waltham AR ASSI Warietta ARC Seneca RC Guelph ARC	344- 4-16- 3096
W8ID/8 VE3ZM/3	Seneca RCGuelph ARC	344- A-16- 3096 462- AB-25- 2976 315- AB-22- 2739 446- B-35- 2676
VE3ZM/3 W8RNF/8 W8OCK/8	Central Michigan ARC	439- B-20- 2634
K1BCI/1 W3PIQ/3	CQ RU Drong Bound	378- AB-39- 2559
TACATA /A	ers & Modulators Club Panama City ARC Reading RC Delaware Valley ARC (nonclub group) Sangamon Valley RC St. Clair ARC Morganton ARC	337- AB-25- 2409 368- B-10- 2358 361- B-20- 2166
W3BN/3 W3CTC/3 W8WNK/8	Reading RC Delaware Valley ARC.	361- B-20- 2166 297-ABC-15- 2118
W8WNK/8 W9DUA/9	(nonclub group) Sangamon Valley RC	304- B-21- 1974 305- AB-30- 1857 351- BC-33- 1761
W9BA/9 K4VLY/4	St. Clair ARC Morganton ARC Calgary AR Assn	351- BC-33- 1761 279- AB-12- 1683
W8WNK/8 W9DUA/9 W9BA/9 K4VLY/4 VE6NQ/6 W7KYC/7 W7GUX/7	Calgary AR Assn Portland ARC	181- AB- 9- 1278
W7GUX/7	Portland ARC	20- B- 8- 120
W2VDJ/2	Transmitters Operated Sim Lakeland AR Assn Ridgewood RC	1368- A-18-12,537
W2GTD/2	Ridgewood RC	1177- A-14-10,818



Wright-Patterson Communicators Club, K8AIR/8

W7DK/7 W5CF/5 K6BTR/6 W6PW/6 W1ECO/1 W6OTX/6 W1GLA/1 W4EOH/4 W6PMK/6 W6WJ/6 W6WJ/6 W6WJ/6 W6WUD/3 W4MOE/4 W8DZK/8 K6DBS/6 K4EWE/4 W3LDV/3	RC of Tacoma. Kilocycle Club. Mountain View ARC. San Francisco RC. Sub Sig ARC. Palo Alto AR Assn. Framingham RC. Jefferson County AREC. North Peninsula Electronics Club. South County AR Soc. San Mateo RC. Antictam R Assn. Asheville ARC. Ft. Hamilton AR Assn. Convair RAC. Greeneville ARC. Anthracite Wireless Assn.	930- 914- 724- 858- 533- 601- 535- 576- 617 551- 424- 526- 650- 349- 252- 237-	A-41- 8595 B-19- 5658 AB-31- 5353 AB-31- 5343 A-43- 5022 AB-20- 4944 A 4815 AB-28- 4680 A-13- 4554 AB-25- 4397 AB-30- 4149 AB-15- 4026 B-17- 3306 A-13- 1950 BC-12- 1863 AB-13- 1524 C- 7- 786
Etaht	Transmitters Operated Sim	ultaneo	นรโน
W2JIO/2 W6UW/6	Fordham RC Santa Clara County AR		A-52-17,793
W5DPA/5 K6QZJ/6	Assn	1186- 853-	AB-30- 8682 AB-35- 5979
W6BXN/6 W1AEW/1	Assn Turlock ARC Pioneer Valley RC	470- 662- 435-	A-26- 4455 AB-25- 4119 AB-35- 3285
Nine	Transmitters Operated Sim	ultaneo	usly
W1OC/1 W6TOI/6 W7NCW/7	Concord Brasspounders Downey ARC Lower Columbia AR	1166-	A-25-14,904 AB-26- 8607 AB-27- 5943
W9UVI/9	Assn		A-28- 2961
Ten.	Transmitters Operated Simi	dtaneor	uslu
WØGM/Ø	Cedar Valley ARC		AB-40- 2640
Eleven	Transmitters Operated Sim	ultane	ously
W2GSA/2 W5SC/5 K6DTA/6 W3RCN/3 W9RK/9 VE3NAR/3 W3GV/3	Garden State AR Assn. San Antonio RC. West Valley RC. Rock Creek AR Assn. Northwest ARC. Nortown ARC. R Assn. of Erie	2590- 2099- 1629- 1143- 1101- 733- 381-	A-42-14.796 A-75-10,584 A-33-10,134 AB-42-4740
Twelve	Transmitters Operated Sin	nultane	ously
$rac{ m W2LI/2}{ m K6EA/6}$	Tri-County R Assn Associated RA of Long Beach		
Thirtee	n Transmitters Operated Si		
W6UF/6	Eimac Gang RC		

#### CLASS B

Grouped in this listing are the scores of portable stations manned by one or two operators. Where two persons participated, the call of the other operator (if known) is given below that of the amateur whose call was used. Figures fol-lowing the calls indicate number of contacts, power and final score.

One !	Transmitte	2 <b>7</b>		400-	B-2400
K6GOI/6 \	323-	4-4795	W6WII		2 2100
W6AWP	343-	A-4120	KN2LFK/2	142-	A - 2309
K6QIK/6	294-	A-3969	K2TXD	, , , , , ,	
K6QHZ	402-		W8MZA/8	223-	A-2232
W3MSR/8.			W8EOP		
W2JBQ/2	228-	A-3416	W5YFN/5	369	B-2214
W2FBA			K7ANM		
W6DUS/6	319-	A-3096	W9YYG/9	220-	A - 2205
W7KSE	(		W9UBI		==00
K4KUZ/4	383-	B-2448	W5NXE/5	218-	A-2187
K4QHG	·		W5RMH		
K5DRC/5	242-	A-2403	K9IBB/91	238-	A-2142
K5ATD	}		W3TLN/4	153-	A-2066



Lakeland Amateur Radio Assn., W2VDJ/2

$\frac{\text{K2UTV/2}}{\text{WV2AKK}}$ 204- A-2061	W7UNV/7 \ 122- B- 708
	$\frac{W70NV77}{W7TXZ}$ \133- B- 798
W7CAF/72331- B-1986	W10JR/134- A- 797
$W7NQP/7^2170-A-1755$	W3FIM/3259- A- 797
WEDTE /E	W8EWT/82131- B- 792
K5BFE279- B-1674	K6IYM/6
K5KBS/5182- A-1638	
TATESTO (E)	KOMZZ )
W5VC/5 \269- B-1614	$\frac{\text{K9AXD}/9}{\text{K9CVU}}$ 127- B- 762
K5EMA200 B 1014	K9CYU J
K4LDR/4 \171- A-1539	K6ALJ/955- A- 738
W4WHK SIII A 1999	W10EO/ $1^2$ 117- B- 702
W3EMD/3 \248- B-1488	K6VDG/651- A- 689
W3JYW J240 B 1466	KØIBW/Ø288- B- 672
W90EY/9 \81- A-1431	$W90MT/9^2112-B-678$
W9OHU J A-1431	K9HAA/9 \100-AB- 672
W8SKU/8156- A-1404	M3C1V
K8CCV150- A-1404	K4KAK/42111- B- 666
K2DRN/2152-AB-1380	W7GVV/7 \110- B- 660
	W/PIK
K7BSO/7299- A-1337	VE1TV/1 \109- B- 654
WØUXT/Ø )213- B-1278	VEIACE / 105 B 054
KVAQO	W8JXU/8 \72- A- 648
W3EEB/3 \140- A-1260	KSAXR
W3DQZ	K2SOW/2 \46- B- 639
WØKRD/Ø2184− B-1254	W2TGR40- B- 659
K2MBU/2 \66- A-1229	33711337777 /4 )
KZMKC	$\frac{\text{W1FJG}}{\text{W1FJG}}$ \ \cdots 70- A- 630
W6MBN/6 \193-AB-1191	KODDIA )
AA OTAT A CO	$\frac{\text{K2RD3}}{\text{K2TIU}}$ \ \dots \tag{46-} \ \text{A-} \ \text{621}
K2SFS/2 <sup>2</sup> 107- B-1188	K5MIA/52102- B- 612
W5VVF/5130- A-1170	K6SCH/6
K2PGC/2 \ 185- D 1140	K6EDE \62- A- 558
KZPSR	W7VCB/792- B- 552
W2TXU/2126- A-1134	
W80EQ/83155- B-1080	K4DVM/491- B- 546
WØPBI/Ø \ 05- 4 1000	W1SMO/160~ A- 540
WØTKX / 55- A-1080	K8DKU/889- B- 534
W6NKR/6 \173- B-1038	7773070 (377.40.)
K6ZPE ( 175 B-1038	VE3CIR13- A- 513
WØWIE/Ø250- A-1026	K2AZJ/2
K5CXY/5 \ 50- A-1026	$\frac{K2A23/2}{K2VXA}$ 56- A- 504
W5ECS  170- B-1020	W8FNI/82153-AB- 503
L'GDENT /G	W7AGE/7
K6JLR113- A-1017	W7NCB \36- A- 486
W7GUS/787- A-1008	WINCE
W7BJW \87- A-1008	
W9KZM/9131- B- 942	W9TRF/9250- B- 450
W9JJT }151- B- 942	K6MID/633- A- 446
VE2AKX/2130- B- 930	W2CGK/24148- A- 444
VE2AVF150- B- 930	K6SAF/6
W7C7N(7)	WA6ADL \74- B- 444
K7AWP \76- A- 909	W7FTD/7 )
W8HUP/867- A- 905	W7FSP  69- B- 414
K2KGJ/2100~ A~ 900	KØEKA/Ø
K2SYS/2 K2HVI \119-AB- 900	110010
K7AMW/7 ) 150 D 000	W3YNC/342- A- 378
W7GRA \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	W4FLX/463- B- 378
K6YEA/6298- A- 882	W6EUH/7185- B- 370
W4RWM/435- A- 810	WN2TNP/21- A- 351
TITTLITIC (TT.)	W9CHD/9
W70PS// \269- C- 807	K9DSE \57- B- 342
,	,

## CLUB AGGREGATE MOBILE SCORES

Westpark Radiops
Radio Amateur Mobile Society of Sacramento 14 278
Associated Radio Amateurs of Long Beach 12 424
Phil-Mont Mobile Radio Club (Penna ) 11 002
West Philadelphia Radio Assn 5220
Norwalk Amateur Radio Club (Calif) 1017
Mobile Amateur Radio Club of South Rend 1634
Denver Radio Club
Atlanta Radio Chin 704
Redwood Falls Amateur Radio Club (Minn ) 562
Connecticut Wireless Assn. 519
riughes Amateur Radio Clirb (Calif ) 500
Collee Dunkers of Detroit 125
Central Olieens Radio Club
Shelby County Radio Club (Ind.)

$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	B- 318 C- 306	W1EZM/1 }30-	B- 60
KØMZN/Ø }33-	A= 207	K6ZWB/6	
KUIFC	A 201	W6YND }6-	
KL7COJ/KL7 } 49-	B- 294	K7BAH/7214-	A- 42
W2UJS/230-	4- 270	WN2RZK/24-	B- 36 B- 30
W10AK/143-	B- 258	W8QIW/85- KN8IPK/810-	A- 30
K5C EM (# )		W5CIN/56-	C- 18
K5LTO \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	A- 252		
K2UVL/2 <sup>2</sup> 83-	A- 249	Two Transmitte	rs
WN6NOK/6241-	B- 246	K5DCO/5 \370-	A-2330
W9FCC/9238-	B- 228	TODAT	21 0000
W1IWK/1275- KN5QFL/5		K6HGF/6 \291-	A-2880
$\frac{1}{\text{KN5QJR}}$ 25-	A- 225	VIVONITA	
K6DXA/636-	B- 216	VE2BN \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	A-2646
K5HWY/5141-	C- 166	K4DTI/42256-	A-2520
		W3EAN/32251-	B-1506
K2SBT70-	B- 140	K2TJM/2 ) 01-	
$ \begin{pmatrix} W_{6IAH/6} \\ W_{6EA} \end{pmatrix} $ 10-	A = 135		A-1044
WEEA J	A 195	K4JXL/4 )81-	B- 486
KN8HVV/8 <sup>2</sup> 15- W5QNT/520-	A- 135 D- 120	IX-4 LIV U	
K6TIP/638-	A= 114	WØBYC/Ø68- VE3DSA/3	B- 408
K3AKR/346-	B- 92	VE2JY \52-	A- 156
VE4JW/4213-	B- 78	Wering	
K2UUT/222-	A- 66	K8AQP15-	A- 45
		,	

#### CLASS C

Grouped in this tabulation are the scores of entrants in the mobile class. Figures following the call indicate number of contacts, power and final score.

One Transmi	tter	K9CAZ/97 W3HAU/3	103-	AB- 69
W8PVC/8280	- A~5036	W3HAU/3	24-	A- 67
$K6EPC/6^{5}213$	- A-3213	K6YMT/6	50-	A- 67
W8GMK/894	- A-2525	K6HYC/6		
W80HA/894	A-2020	Wabbb /	23-	
Wooday 6	- A-2525	W3BBB/3	22–	A- 63
W8QAV/880 W8MWE/875 W8AEU/874	- A-2336	W6ENR/6 K6MQU/6	47–	A- 63
W8MWE/875	- A-2268	K6MQU/6	22-	A- 63
W8AEU/8 74	- A-2255	W3QQH/3	21-	A- 62
W80XG/8 74	$ \widehat{A}$ $-2255$	W3IIZE/3	20-	A- 60
W8QXG/8. 74 W8NYX/8. 70 W8PVA/8. 68 W8OXI/8. 66	- A-2201	W3QQH/3 W3UZF/3 W6QPX/6 K6BJU/6	20-	
WODY	- A-2201	TOD III	20-	A- 60
W8PVA/868	- A-2174	KOBJU/6	20-	A- 60
W80X1/866	- A-2147	W7HOE/7 W3HQJ/3 K4AJI/4	40-	B- 58
K8ABA/866	- A-2147	W3HQJ/3	18-	A- 58
W8RAK/865	- A-2133	K4AJI/4	43-	A- 58
W8WZS/8 65	- A-9133	W3MHR/3.	17-	A- 56
W80A1/8 66 K8ABA/8 66 W8RAK/8 65 W8WZS/8 65 WØLPA/Ø 221 W8AGA/8 64 W8BDZ/8 64	L-AB-9194	W6IQF/6 K6JNV/6 W4ISS/4 W6VHT/6	49	A- 56' A- 56' A- 56'
WOACAO	A 0100	WEINING	10	A- 50
WODDZ (0	- A-Z120	TOUTH V/O	13-	A- 56
		W4188/4	37-	B- 558
W8BUQ/864- W8CVW/864-	- A-2120	W6VHT/6	15-	A- 540
W8CVW/864-	- A-2120	W9TWA/9 W3FDJ/3	40-	A- 540
W 8 UZIVI / 8	- A-2120	W3FDJ/3	14-	A- 52
W8FKB/8 64-				A- 527
	- A-2120			A- 52 A- 52 A- 51
W8NGY/864-	- A-2120	WOTIL /0	10-	A- 516
WONTMA /0	A-2120	WOINE (C)	38-	A- 513
W8NMA/864-	- A-2120	W9INF/98	84-	B- 504
W8NOX/864- W8 YIU/864-	- A-2120 - A-2120 - A-2120 - A-2120 - A-2120 - A-2120	W9TIL/9 W9INF/98 W6ZVD/6	36-	A- 486
W8 'IU/864-	- A-2120			B- 468
	- A-2120 - A-2120 - A-2120 - A-2120	W3LKI/3	7-	A- 432
W8QYS/864-	- A-2120			A- 419
W8QYS/864- W8UZJ/864-	- A-2120			
W8VUI/864-	A 2120	W3IVD/3		
WOTEH /0	A-2120	W79GAA (9	4-	A- 392
W8ZEU/864- W8ZJQ/84-	- A-2120	W3SAA/3	4-	A- 392
W82JQ/8	- A-2120	K6MW V/6.	4-	A- 392
K8CLH/8. 64- W3VXN/3. 107- W3CNO/3. 98-	- A-2120	K6MWV/6 WØPB/Ø	2-	A- 365
W3VXN/3107-	- A-1782	W3GOQ/3	1-	A- 351
W3CNO/398-	A-1661	W3GOV/3	1	A- 351
WBGTG/6 81-	- A~1431	W3GOQ/3 W3GOV/3 W3JXI/3 W3JXS/3	· · · · · î_	A- 351
W 8 N Z I / 9 C 5 -	D 1499	W3IVS/3	1	
W6GGW/673-	- A-1324	W3ZHE/3		A- 351 A- 351
K6EWH/667-				
		TZ2DDD /0	1-	
DICODIVIO	- A-1242	K3DBP/3	i-	A- 351
W60PV/6 66-	A-1242	K3DBP/3 W6KTS/6	1-	A- 351 A- 338
W6OPY/666- K6VUZ/660-	- A-1242 - A-1229 - A-1148	K3DBP/3 W6KTS/6 WØKAI/Ø	1-	A- 351 A- 338 B- 288
W6OPY/666- K6VUZ/660- K6OOP/684-	- A-1242 - A-1229 - A-1148 - A-1134	K3DBP/3 W6KTS/6 WØKAI/Ø KN6SES/6	25-	A- 351 A- 338 B- 288
W6OPY/666- K6VUZ/660- K6OOP/684-	- A-1242 - A-1229 - A-1148 - A-1134	K3DBP/3 W6KTS/6 WØKAI/Ø KN6SES/6 W5FIX/5	25-	A- 351 A- 338 B- 288
W6OPY/666- K6VUZ/660- K6OOP/684- W3HAS/352- W6BRT/6	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A-072	K3DBP/3 W6KTS/6 WØKAI/Ø KN6SES/6 W5FIX/5 KN6LEO/6	2572027-	A- 351 A- 338 B- 288 A- 270 B- 243
W6OPY/666- K6VUZ/660- K6OOP/684- W3HAS/352- W6BRT/6	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A-072	K3DBP/3 W6KTS/6 WØKAI/Ø KN6SES/6 W5FIX/5 KN6LFO/6	1- 25- 7- 20- 27- 17-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 230
W6OPY/666- K6VUZ/660- K6OOP/684- W3HAS/352- W6BRT/6	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A-072	K3DBP/3 W6KTS/6 W0KAI/Ø KN6SES/6 W5FIX/5 KN6LFO/6 W4FYH/4	1- 25- 7- 20- 27- 17- 15-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 230 A- 203
W6OPY/666- K6VUZ/660- K6OOP/684- W3HAS/352- W6BRT/6	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A-072	K3DBP/3 W6KTS/6 W6KTS/6 KN6SES/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6	1- 25- 7- 20- 27- 15- 15-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 230 A- 203 A- 203
W6OPY/6 66- K6VUZ/6 60- K6OOP/6 84- W3HAS/3 52- W6BRT/6 21- W6QHP/6 47- WØFUH/Ø6 80- W6GAU/6 12-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864	K3DBP/3 W6KTS/6 W6KTS/6 KN6SES/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6	1- 25- 7- 20- 27- 15- 15-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 203 A- 203 A- 162
W6OPY/6 66- K6VUZ/6 60- K6OOP/6 84- W3HAS/3 52- W6BRT/6 21- W6QHP/6 47- W6FUH/Ø6 80- W6GAU/6 12- W6BTP/6 63-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864 - A- 864	K3DBP/3 W6KTS/6 W6KTS/6 KN6SES/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6	1- 25- 7- 20- 27- 15- 15-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 203 A- 203 A- 162 A- 162
W60PY/6 66- K6VUZ/6 60- K60OP/6 84- W3HAS/3 52- W6BRT/6 21- W6QHP/6 47- WØFUH/Ø <sup>6</sup> 80- W6GAU/6 12- W6GAU/6 61- W6YOL/6 63-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864 - A- 851	K3DBP/3 W6KTS/6 W6KTS/6 KN6SES/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6	1- 25- 7- 20- 27- 15- 15-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 203 A- 203 A- 162 A- 162
W60PY/6 66- K6VUZ/6 60- K60OP/6 84- W3HAS/3 52- W6BRT/6 21- W6QHP/6 47- WØFUH/Ø <sup>6</sup> 80- W6GAU/6 12- W6GAU/6 61- W6YOL/6 63-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864 - A- 851	K3DBP/3 W6KTS/6 W6KTS/6 KN6SES/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6	1- 25- 7- 20- 27- 15- 15-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 203 A- 203 A- 162 A- 162 A- 162
W60PY/6 66- K6VUZ/6 60- K60OP/6 84- W3HAS/3 52- W6BRT/6 21- W6QHP/6 47- WØFUH/Ø <sup>6</sup> 80- W6GAU/6 12- W6GAU/6 61- W6YOL/6 63-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864 - A- 851	K3DBP/3 W6KTS/6 W6KTS/6 KN6SES/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6	1- 25- 7- 20- 27- 15- 15-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 203 A- 203 A- 162 A- 162 B- 153
W60PY/6 66- K6VUZ/6 60- K60OP/6 84- W3HAS/3 52- W6BRT/6 21- W6QHP/6 47- WØFUH/Ø <sup>6</sup> 80- W6GAU/6 12- W6GAU/6 61- W6YOL/6 63-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864 - A- 851	K3DBP/3 W6KTS/6 W6KTS/6 KN6SES/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6	1- 25- 7- 20- 27- 15- 15-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 203 A- 203 A- 162 A- 162 A- 162 A- 162 A- 149
W60PY/6 66- K6VUZ/6 60- K60OP/6 84- W3HAS/3 52- W6BRT/6 21- W6QHP/6 47- WØFUH/Ø <sup>6</sup> 80- W6GAU/6 12- W6GAU/6 61- W6YOL/6 63-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864 - A- 851 - A- 851 - A- 810 - A- 810	K3DBP/3 W6KTS/6 W6KTS/6 KN6SES/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6	1- 25- 7- 20- 27- 15- 15-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 203 A- 203 A- 162 A- 162 B- 153 B- 149 A- 149
W60PY/6 66- K6VUZ/6 60- K6VUZ/6 60- K6VOZ/6 60- K6VOZ/6 84- W3HAS/3 52- W6BRT/6 21- W6QHP/6 47- WØFCH/Ø 80- W6CAU/6 12- W6BTP/6 63- W6KQI/6 11- W6CKM/6 3- W5XFV/3 3- W5WRU/6 8- W5NOW/KH6 89-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864 - A- 851 - A- 851 - A- 810 - A- 810	K3DBP/3 W6KTS/6 W6KTS/6 KN6SES/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6	1- 25- 7- 20- 27- 15- 15-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 203 A- 203 A- 162 A- 162 B- 153 A- 149 A- 149 A- 149 A- 135
W60PY/6 66- K6VUZ/6 60- K6VUZ/6 60- K6VOZ/6 60- K6VOZ/6 84- W3HAS/3 52- W6BRT/6 21- W6QHP/6 47- WØFCH/Ø 80- W6CAU/6 12- W6BTP/6 63- W6KQI/6 11- W6CKM/6 3- W5XFV/3 3- W5WRU/6 8- W5NOW/KH6 89-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864 - A- 851 - A- 851 - A- 810 - A- 810	K3DBP/3 W6KTS/6 W6KTS/6 KN6SES/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6	1- 25- 7- 20- 27- 15- 15-	A- 351 A- 338 B- 288 B- 270 B- 243 A- 203 A- 203 A- 162 A- 162 B- 153 A- 149 A- 135 B- 126
W60PY/6 66- K6VUZ/6 60- K6VUZ/6 60- K6VOZ/6 60- K6VOZ/6 84- W3HAS/3 52- W6BRT/6 21- W6QHP/6 47- WØFCH/Ø 80- W6CAU/6 12- W6BTP/6 63- W6KQI/6 11- W6CKM/6 3- W5XFV/3 3- W5WRU/6 8- W5NOW/KH6 89-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864 - A- 851 - A- 851 - A- 810 - A- 810	K3DBP/3 W6KTS/6 W6KAL/6 KN6SES/6 W5FIX/5 KN6LF0/6 W4FYH/4 K6ZGI/6 W9AYU/9 W1WUR/1 W9BRM/9 W9ZNM/6 W9CF/6 W9CBM/6 W9CF/6 W9CBM/6	1- 25- 20- 27- 15- 15- 12- 12- 17- 11- 9- 12- 12-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 230 A- 203 A- 162 B- 153 A- 149 A- 149 A- 135 B- 126 A- 108
W60PY/6 66- K6VUZ/6 60- K6VUZ/6 60- K6VOZ/6 60- K6VOZ/6 84- W3HAS/3 52- W6BRT/6 21- W6QHP/6 47- WØFCH/Ø 80- W6CAU/6 12- W6BTP/6 63- W6KQI/6 11- W6CKM/6 3- W5XFV/3 3- W5WRU/6 8- W5NOW/KH6 89-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864 - A- 851 - A- 851 - A- 810 - A- 810	K3DBP/3 W6KTS/6 W6KAI/Ø KN68SES/6 W5FIX/5 KN6LF0/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9MYI/9 W1WUR/1 W9BRM/9 W6ZBM/Ø W8CBM/Ø W6UCF/Ø K6KDK/6		A- 351 A- 338 B- 288 A- 270 B- 243 A- 230 A- 162 B- 153 A- 169 B- 153 A- 149 A- 135 B- 126 A- 108 B- 134 B- 135 B- 126 A- 108
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W6FGH/0. 12- W6BTP/6. 63- W6KQI/6. 11- W6KGM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW.KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6WQI/6. 6-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864 - A- 851 - A- 851 - A- 810 - A- 810	K3DBP/3 W6KTS/6 W6KAI/Ø KN6SES/6 W5FIX/5 KN6LF0/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W1W1R1 W9HRM/9 WØZNM/Ø W6UEF/Ø K6KDR/Ø K6KDR/Ø K9EUJ/9		A- 351 A- 338 B- 288 A- 270 B- 243 A- 230 A- 203 A- 162 A- 162 B- 153 A- 149 A- 135 B- 126 A- 108
W60PY/6. 66- K6VUZ/6. 660- K6VUZ/6. 660- K60OP/8. 84- W3HAS/3. 52- W6BRT/6. 21- W6CHP/6. 47- W6FUH/98. 80- W6CAU/6. 12- W6KM/6. 12- W6KM/6. 13- W6KQI/6. 11- W6CKM/6. 39- W8NOW/KH6. 89- W8NOW/KH6. 89- W8NOW/KH6. 89- W8VOW/6. 34- K2DGE/3. 34- W6VQH/6. 6- K6DJE/6. 3- W8PXY/3. 33- W6VQH/6. 6-	- A-1242 - A-1229 - A-1148 - A-1134 - A-1040 - A- 972 - A- 972 - B- 945 - A- 864 - A- 851 - A- 851 - A- 810 - A- 810	K3DBP/3 W6KTS/6 W6KAI/Ø KN68SES/6 W5FIX/5 KN6LF0/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9MYI/9 W1WUR/1 W9BRM/9 W6ZBM/Ø W6CBM/Ø K6KDK/6 K9EUJ/9 W1NJM/1	11252027171512121711191012810481044444444444444444	A- 351 A- 388 B- 288 A- 270 B- 243 A- 203 A- 203 A- 162 A- 162 A- 162 A- 149 A- 149 B- 153 B- 126 A- 108 B- 199
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KAI/Ø KN68SES/6 W5FIX/5 KN6LF0/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9MYI/9 W1WUR/1 W9BRM/9 W6ZBM/Ø W6CBM/Ø K6KDK/6 K9EUJ/9 W1NJM/1	11252027171512121711191012810481044444444444444444	A- 351 A- 388 A- 270 B- 243 A- 203 A- 203 A- 162 B- 153 A- 162 B- 153 A- 149 A- 149 A- 149 B- 108 B- 108 B- 99 B- 99 B- 99 B- 98
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KTS/6 W6KAI/Ø KN6SES/6 W5FIX/5 KN6LF0/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W1W1R1 W9HRM/9 W9ZNM/Ø W9UCF/Ø K6KDR/6 K9EUJ/9 WINJM/1 WØLJO/Ø WINJM/1 WØLJO/Ø	11-25-7-20-27-27-15-12-12-17-11-12-12-12-12-12-12-12-12-12-12-12-12-	A- 351 A- 388 A- 270 B- 243 A- 203 A- 203 A- 162 A- 162 A- 162 A- 149 A- 149 A- 108 A- 108 B- 36 B- 36 B- 36
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KTS/6 W6KAI/Ø KN6SES/6 W5FIX/5 KN6LF0/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W1W1R1 W9HRM/9 W9ZNM/Ø W9UCF/Ø K6KDR/6 K9EUJ/9 WINJM/1 WØLJO/Ø WINJM/1 WØLJO/Ø	11-25-7-20-27-27-15-12-12-17-11-12-12-12-12-12-12-12-12-12-12-12-12-	A- 351 A- 388 A- 270 B- 243 A- 203 A- 203 A- 162 B- 153 A- 162 B- 153 A- 149 A- 149 A- 108 B- 199 B- 36 B- 36 A- 203
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KAI/Ø KN6SES/6 W5FIX/5 KN6LF/0/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9WUR/1 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9UR/1 W9BRM/9 W9UR/1 W9BRM/9	11-25-7-20-27-27-27-27-27-27-27-27-27-27-27-27-27-	A- 351 A- 388 B- 288 A- 270 B- 243 A- 203 A- 203 A- 162 A- 162 A- 162 A- 162 A- 162 B- 153 A- 149 A- 149 A- 108 B- 198 B- 36 B- 36 A- 27 A- 27
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KAI/Ø KN6SES/6 W5FIX/5 KN6LF/0/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9WUR/1 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9UR/1 W9BRM/9 W9UR/1 W9BRM/9	11-25-7-20-27-27-27-27-27-27-27-27-27-27-27-27-27-	A- 351 A- 388 B- 288 A- 270 B- 243 A- 203 A- 162 A- 162 B- 153 A- 149 A- 149 A- 149 A- 108 B- 108 B- 36 B- 36 A- 27 A- 27 A- 27
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KAI/Ø KN6SES/6 W5FIX/5 KN6LF/0/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9WUR/1 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9UR/1 W9BRM/9 W9UR/1 W9BRM/9	11-25-7-20-27-27-27-27-27-27-27-27-27-27-27-27-27-	A- 351 A- 338 B- 288 A- 270 B- 243 A- 230 A- 203 A- 162 A- 162 A- 162 A- 162 B- 153 B- 126 A- 108 B- 199 B- 36 B- 36 B- 36 B- 27 A- 27 A- 27 A- 27 A- 27
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KAI/Ø KN6SES/6 W5FIX/5 KN6LF/0/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9WUR/1 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9BRM/9 W9UR/1 W9BRM/9 W9UR/1 W9BRM/9	11-25-7-20-27-27-27-27-27-27-27-27-27-27-27-27-27-	A- 351 A- 388 B- 288 A- 270 B- 243 A- 203 A- 162 A- 162 B- 153 A- 149 A- 149 A- 149 A- 108 B- 108 B- 36 B- 36 A- 27 A- 27 A- 27
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KTS/6 W6KAI/Ø/KN6SES/6 W5FIX/5 KN6LF0/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AY1/9 W9WIV/9 W1WUR/1 W9BRM/9 W5CBM/6 W5CB	1- 25- 7- 20- 27- 17- 15- 12- 12- 12- 12- 11- 10- 12- 8- 8- 8- 4- 2- 2- 2- 1- 11- 11- 11- 12- 12- 12- 12	A- 351 A- 338 B- 288 B- 288 B- 243 A- 203 A- 203 A- 162 A- 162 A- 162 B- 153 A- 149 A- 135 B- 128 B- 230 A- 149 A- 135 B- 243 B- 27 A- 148 B- 48 B- 99 B- 36 B- 48 B- 99 B- 36 B- 48 B- 4
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KAI/Ø KM6SES/6 W5FIX/5 KN6LFO/6 W4FPH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9MYI/9 W9WWR/I W9BRM/9 W6ZBM/Ø W8CBM/Ø W8CBM/Ø W8CBM/Ø W8CBM/Ø W8UCF/Ø K6KDK/6 K9EUJ/9 W1NJM/1 W9LJV/2 W1NJM/1 W9LJV/2 W1NJM/1 W6LJO/Ø K9EUJ/9 W1NJM/1 W6LJO/W1 W1NJM/1 W6LJO/W1 W1NJM/1 W6LJO/W1 W1NJM/1 W6LJO/W1 W1NJM/1 W6LJO/W1 W1NJM/1 W6LJO/W1 W1 W1NJM/1 W6LJO/W1 W1 W	1- 25- 7- 20- 27- 17- 15- 15- 12- 12- 11- 9- 10- 12- 8- 10- 4- 4- 2- 2- 1- 11-  nsmitter	A- 351 A- 388 B- 288 A- 270 B- 243 A- 230 A- 203 A- 203 A- 162 A- 162 B- 153 A- 149 A- 135 B- 126 A- 108 B- 98 B- 36 A- 27 A- 27 A- 27 A- 14 B- 9
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KTS/6 W6KTS/6 W6KTS/6 W6KTS/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9MYI/9 W1WUR/1 W9BRM/9 W6ZNM/9 W8CBM/9 W8CBM/9 W8UCF/9 K6KDK/6 K9EUJ/9 W1NJM/1 W9LJO/9 W9LJUX/2 K9EUZ/2 W1HDQ/1 W9KKM/9  **TWO Troo Troo **TWO T	1- 25- 7- 20- 17- 17- 15- 12- 12- 12- 11- 19- 10- 12- 2- 2- 10- 11- 4- 4- 2- 2- 11- 11- 11- 11- 11- 11- 11- 11-	A- 351 A- 358 B- 288 B- 243 A- 203 A- 203 A- 162 A- 162 B- 26 B- 26 B- 26 B- 26 B- 27 A- 162 B- 36 B- 3
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KTS/6 W6KTS/6 W6KTS/6 W6KTS/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9MYI/9 W1WUR/1 W9BRM/9 W6ZNM/9 W8CBM/9 W8CBM/9 W8UCF/9 K6KDK/6 K9EUJ/9 W1NJM/1 W9LJO/9 W9LJUX/2 K9EUZ/2 W1HDQ/1 W9KKM/9  **TWO Troo Troo **TWO T	1- 25- 7- 20- 17- 17- 15- 12- 12- 12- 11- 19- 10- 12- 2- 2- 10- 11- 4- 4- 2- 2- 11- 11- 11- 11- 11- 11- 11- 11-	A- 351 A- 358 B- 288 B- 243 A- 203 A- 203 A- 162 A- 162 B- 26 B- 26 B- 26 B- 26 B- 26 B- 26 B- 36 B- 36
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KTS/6 W6KTS/6 W6KTS/6 W6KTS/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9MYI/9 W1WUR/1 W9BRM/9 W6ZNM/9 W8CBM/9 W8CBM/9 W8UCF/9 K6KDK/6 K9EUJ/9 W1NJM/1 W9LJO/9 W9LJUX/2 K9EUZ/2 W1HDQ/1 W9KKM/9  **TWO Troo Troo **TWO T	1- 25- 7- 20- 17- 17- 15- 12- 12- 12- 11- 19- 10- 12- 2- 2- 10- 11- 4- 4- 2- 2- 11- 11- 11- 11- 11- 11- 11- 11-	A- 351 A- 358 B- 288 B- 243 A- 203 A- 203 A- 162 A- 162 B- 26 B- 26 B- 26 B- 26 B- 26 B- 26 B- 36 B- 36
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KTS/6 W6KTS/6 W6KTS/6 W6KTS/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9MYI/9 W1WUR/1 W9BRM/9 W6ZNM/9 W8CBM/9 W8CBM/9 W8UCF/9 K6KDK/6 K9EUJ/9 W1NJM/1 W9LJO/9 W9LJUX/2 K9EUZ/2 W1HDQ/1 W9KKM/9  **TWO Troo Troo **TWO T	1- 25- 7- 20- 17- 17- 15- 12- 12- 12- 11- 19- 10- 12- 2- 2- 10- 11- 4- 4- 2- 2- 11- 11- 11- 11- 11- 11- 11- 11-	A- 351 A- 358 B- 288 B- 243 A- 203 A- 203 A- 162 A- 162 B- 26 B- 26 B- 26 B- 26 B- 26 B- 26 B- 36 B- 36
W60PY/6. 66- K6VUZ/6. 60- K6VUZ/6. 60- K60OP/6. 84- W3HAS/3. 52- W6BRT/6. 21- W60HP/6. 47- W∅FCHI/∅ <sup>6</sup> . 80- W6GAU/6. 12- W6BTP/6. 63- W6KQI/6. 11- W6GKM/6. 9- W3YFV/3. 35- W6MRU/6. 8- W8NOW/KH6. 89- W6VNC/6. 34- K2DGE/3. 34- W3PXY/3. 33- W6VQH/6. 6- K6DJE/6. 33- K6KNP/6. 6- K6DJE/6. 63-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KTS/6 W6KTS/6 W6KTS/6 W6KTS/6 W5FIX/5 KN6LFO/6 W4FYH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9MYI/9 W1WUR/1 W9BRM/9 W6ZNM/9 W8CBM/9 W8CBM/9 W8UCF/9 K6KDK/6 K9EUJ/9 W1NJM/1 W9LJO/9 W9LJUX/2 K9EUZ/2 W1HDQ/1 W9KKM/9  **TWO Troo Troo **TWO T	1- 25- 7- 20- 17- 17- 15- 12- 12- 12- 11- 19- 10- 12- 2- 2- 10- 11- 4- 4- 2- 2- 11- 11- 11- 11- 11- 11- 11- 11-	A- 351 A- 358 B- 288 B- 243 A- 203 A- 203 A- 162 A- 162 B- 26 B- 26 B- 26 B- 26 B- 26 B- 26 B- 36 B- 36
W60PY/6. 66- K6VUZ/6. 660- K6VUZ/6. 660- K60OP/8. 84- W3HAS/3. 52- W6BRT/6. 21- W6CHP/6. 47- W6FUH/98. 80- W6CAU/6. 12- W6KM/6. 12- W6KM/6. 13- W6KQI/6. 11- W6CKM/6. 39- W8NOW/KH6. 89- W8NOW/KH6. 89- W8NOW/KH6. 89- W8VOW/6. 34- K2DGE/3. 34- W6VQH/6. 6- K6DJE/6. 3- W8PXY/3. 33- W6VQH/6. 6-	- A-1242 - A-1229 - A-1148 - A-1040 - A-972 - A-972 - A-972 - A-864 - A-861 - A-861 - A-810 - A-810 - A-797 - A-797 - A-783 - A-783 - A-783 - A-783	K3DBP/3 W6KTS/6 W6KAI/Ø KM6SES/6 W5FIX/5 KN6LFO/6 W4FPH/4 K6ZGI/6 W6GEB/6 W9AYU/9 W9MYI/9 W9WWR/I W9BRM/9 W6ZBM/Ø W8CBM/Ø W8CBM/Ø W8CBM/Ø W8CBM/Ø W8UCF/Ø K6KDK/6 K9EUJ/9 W1NJM/1 W9LJV/2 W1NJM/1 W9LJV/2 W1NJM/1 W6LJO/Ø K9EUJ/9 W1NJM/1 W6LJO/W1 W1NJM/1 W6LJO/W1 W1NJM/1 W6LJO/W1 W1NJM/1 W6LJO/W1 W1NJM/1 W6LJO/W1 W1NJM/1 W6LJO/W1 W1 W1NJM/1 W6LJO/W1 W1 W	1- 25- 7- 20- 17- 17- 15- 12- 12- 12- 11- 19- 10- 12- 2- 2- 10- 11- 4- 4- 2- 2- 11- 11- 11- 11- 11- 11- 11- 11-	A- 351 A- 358 B- 288 B- 243 A- 203 A- 203 A- 162 A- 162 B- 26 B- 26 B- 26 B- 26 B- 26 B- 26 B- 36 B- 36

#### CLASS D

Grouped in this tabulation are the scores of home stations operated from emergency power.

K3CJT <sup>13</sup> 470, W5RIN <sup>14</sup> 221, W3OI <sup>15</sup> 212, K9KCQ 13.

(Continued on page 188)

#### OSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country, as listed below. Cards for territories and possessions not listed separately can be mailed to the bureau in the parent country; e.g., cards for French Cameroons (FE8) go to REF in France; cards for VP8s go to RSGB in England. W, K, VE and VO stations only may send foreign cards for which no bureau is listed to ARRL.

For service on incoming foreign cards, see list of domestic bureaus in most QSTs under "ARRL

QSL Bureau."

Algeria: G. Deville, FA9RW, Box 21, Maison-Carree, Alger Angola: L.A.R.A., P.O. Box 484, Luanda

Argentina: R.C.A., Carlos Calvo 1424, Buenos Aires Australia: W.I.A., Box 2611 W, G.P.O., Melbourne Austria: Oe. V.S.V. P.O. Box 15, Klosterneuberg, 2

Azores: Via Portugal

Bahamas: C. N. Albury, Telecommunications Dept., Nassau Barbados: Arthur St.C. Farmer, Storms Gift, Brandons,

Deacons Road, St. Michael Belgian Congo: OQ5FH P.O., Box 614, Jadotville

Belgium: U.B.A., Postbox 634, Brussels Bermuda: R.S.B., P.O. Box 275, Hamilton Bolivia: R.C.B., Casilla 2111, La Paz

Brazil: L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro

British Guiana: D. E. Yong, VP3YG, Box 325, Georgetown British Honduras: L. H. Alpuche, VP1HA, P.O. Box 1, El Cayo

Bulgaria: Box 830, Sofia

Burma: Flt. I.t. Aung Myint, XZ2OM, BAF/1064, % Dept. of V.C.S., D.S. (Air), Ministry of Defense, Rangoon, Union of Burma, Asia

Canton Island: H. B. Johnson, KB6BA, U.S.P.O. 06-50000,

Canton Island, South Pacific

Ceylon: P.O. Box 907, Colombo

Chile: Radio Club de Chile, Casilla 761, Santiago China: M. T. Young, P.O. Box 16, Taichung, Formosa

Colombia: L.C.R.A., P.O. Box 584, Bogotá

Cook Islands: Ray Holloway, P.O. Box 65, Rarotonga Costa Rica: Radio Club of Costa Rica, Box 2412, San Jose Cuba: Radio Club de Cuba, QSL Bureau, Ayestaran 629,

Altos Cerro, Habana

Cyprus: Mrs. E. Barrett, P.O. Box 219, Limassol

Czechosłowakia: C.A.V., P.O. Box 69, Prague I Denmark: OZ2NU, Borge Petersen, P.O. Box 335, Aalborg Dominica: VP2DA, Box 64 Roseau, Dominica, Windward

Dominican Republic: Calle Duarte #76, C. Trujillo

East Africa: (VQ1, VQ3, VQ4, VQ5): P.O. Box 1313, Nairobi, Kenya Colony

Ecuador: Guayaquil Radio Club, Casilla 784, Guayaquil Eire: I.R.T.S. QSL Bureau, 39 Booterstown Ave., Blackrock, Dublin, Ireland

Ethiopia: Telecommunications Amateur Radio Club, P.O.

Box 1047, Addis Ababa
Fiji: S. H. Mayne, VS, R2A Victoria Paraed, Suva

Finland: SRAL, Box 306, Helsinki

Formosa: Hq MAAG, APO 63, San Francisco, California France: R.E.F., BP 26, Versailles (S & O)

France: (F7 only): F7 QSL Bureau, MARS, Headquarters U. S. European Command, APO 128, New York, N. Y. Germany (DL2 calls only): G. E. Verrill, G3IEC, 10 Seahorse St., Gosport, Hants, England

Germany (DL4 calls only): DL4 QSL Bureau, 604th Comm, APO 12, N. Y., N. Y

Germany (DL5 calls only): Via France

Germany (other than above): D.A.R.C., Box 99, Munich 27 Gibraltar: E. D. Wills, ZB21, 9 Naval Hospital Road

Ghana: 9GIAB, John Burton, Telecommunication School, Post & Telecommunication Dept., ACCRA Great Britain (and British Empire): A. Milne, 29 Kechill Gardens, Hayes, Bromley, Kent

Greece: George Zarifis, P.O. Box 564, Athens

Greece (Unlisted SVØs only): USASG, APO 206, New York, N. Y.

Greenland: Commander 8th Air Force, Westover AFB, Mass.

Grenada: VP2GE, St. Georges

Guam: M.A.R.C., Box 145, Agana, Guam, Marianas Islands Guantanamo Bay: Guantanamo Amateur Radio Club, Box 55, NAS, Navy 115, F.P.O., New York, N. Y.

Guatemala: C.R.A.G., P.O. Box 115, Guatemala City

Haiti: Radio Club d'Haiti, Box 943, Port-au-Prince Honduras: O. A. Trochez, P.O. Box 244, Tegucigalpa, D. C. Hong Kong: Hong Kong Amateur Radio Transmitting So-

ciety, P.O. Box 541, Hong Kong Hungary: H.S.R.L., Postbox 185, Budapest 4

Iceland: Islenzkir Radio Amatorar, Box 1058, Reykjavik

India: P.O. Box 534, New Delhi

Indonesia: P.A.R.I., P.O. Box 222, Surabaja, Java

Israel: I.A.R.C., P.O. Box 4099, Tel-Aviv Italy: A.R.I., Viale Vittorio Veneto 12, Milano, Italy

Jamaica: Ruel Samuels, VP5RS, 34 Port Royal Street, in ston

 $Japan~(\mathrm{JA})\colon \mathrm{J.A.R.L.},~\mathrm{Box~377},~\mathrm{Tokyo}$   $Japan~(\mathrm{KA})\colon \mathrm{F.E.A.R.L.},~\mathrm{P.O.}$  Box 111, APO 500, % Postmaster, San Francisco, Calif.

Kenya: East Africa QSL Bureau, Box 1313, Nairobi Korea: Mr. In Kwan Lee, Chief Engineer, Radio Supervisory Bureau, O.P.I.R.O.K. Seoul (HL2AM via ARRL)

Kuwait: William N. Burgess, MP4KAC, % Kuwait Oil

Co., Kuwait, Persian Gulf Lebanon: R.A.L. B.P. 3245, Beyrouth

Liberia: (EL1s only) HARC, P.O. Box 32, HARBEL

Libya: 5A2TZ, Box 372, Tripoli Liechtenstein: via Switzerland

Luxembourg: R. Schott, rue Brouch 35, Esch/Alzette

Macao: Via Hong Kong

Madagascar: P.O. Box 587, Tannarive Madeira Island: P.O. Box 257, Funchal

Malaya: QSL Manager, Box 777, Kuala Lumpur Malta: R. F. Galea, ZB1E, "Casa Galea", Railway Road, Birkirkara

Mauritius: V. de Robillard, Box 155, Port Louis

Mexico: L.M.R.E., Apartado Postal 907, Mexico, D.F. Montserrat: VP2MY, Plymouth Morocco: A.A.E.M., P.O. Box 2060, Casablanca

Morocco: (Tangier International Zone only): Box 150,

Tangier Mozambique: Liga dos Radio-Emissores, P.O. Box 812, Lourenco Marques

Netherlands: V.E.R.O.N., Postbox 400, Rotterdam

Netherland Antilles (Aruba): Verona, Postbox 392, San Nicolas, Aruba

Netherlands Antilles (Curacao): Verona, Postbox 383, Willemstad, Curacao

New Guinea: Via Papua

New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington C1 Nicaragua: YN1RA, Apartado Postal 555, Managua Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe

Norway: N.R.R.L., P.O. Box 898, Oslo Okinawa: O.A.R.C., P.O. Box 739, APO 331, % Postmaster

San Francisco, Calif. Pakistan: Box 4074, Karachi

Panama, Republic of: L.P.R.A., P.O. Box 1622, Panama

Paraguay: R.C.P., P.O. Box 512, Ansuncion

Papua: VK9 QSL Officer, P.O. Box 204, Port Moresby Peru: R.C.P., Box 538, Lima

(Continued on page 190)

# 12th V.H.F. Sweepstakes, Jan. 10 and 11

## Certificates to ARRL Section, Novice, Technician Winners; Gavel to Top-Scoring Club

ALL amateurs who can work 50 Mc. or higher are invited to get into the Twelfth ARRL V.H.F. Sweepstakes to work new states and make new v.h.f. acquaintances. The contest starts at 2:00 P.M. your local time Saturday, January 10, and continues until midnight Sunday, January 11.

Just call "CQ Sweepstakes" or "CQ SS" to get in touch with other contestants, then exchange SS information as shown in this announcement. This dope is similar to a message preamble, with the ARRL section (see page six of this QST) substituted for the city and state, and the signal report replacing the "check." You can rework a station for credit on each v.h.f. band, so ability to work 50, 144, 220, etc., pays off in additional score points.

The rules are unchanged except in one particular. While the contest still starts at 2:00 P.M. (1400) your local standard time, contacts between stations in different time zones can be counted only when the contest period is in progress in both of the zones concerned. The change was made because of the confusion resulting from a widespread 50-Mc.  $F_2$  opening early January 4, 1958, at a time when the contest had begun for eastern competitors but not for westerners. For

purposes of explanation, let's assume that Northern New Jersey's W2PRF, on EST of course, gets going right at the beginning of the 1959 contest. During the first hour, W2PRF can work only stations in the eastern time belt or other stations for whom the contest period is on — VE1s on Atlantic time, say. During his second hour, he can exchange SS preambles with W9s and others on CST because the contest has now begun there. By his fourth hour of operation, W2PRF can work as far west as W6-land and other amateurs on PST.

The scoring system adopted in the last V.H.F. SS continues in force, the multiplier consisting of the number of sections worked plus ten. Should W6NLZ make 100 contacts in 17 different ARRL Sections, his score would be computed as follows:

100 QSOs  $\times 2$  (if all SS data exchanged in both directions)  $\times 200$  (QSO points)  $\times 27$  (17 sections plus 10)  $\times 27$  (10 claimed score)

Certificate awards will go to top-scorers in each of the 73 ARRL sections from which entries are forthcoming. In addition, a certificate will be given to the top Novice and Technician in each

		st	JMM	ARY	OF A.R.	R.L.	V.H	.F. SWE	EPS7	TAKES EX	CHANGE	S		
	Stat	ion			Class	License		· · · · · · · · · · · · · · · · · · ·		ARRL Sect	ion			
_		SENT	(1 point	·)				RECE	IVED (	(1 point)			Number of Each Different	
Freq. Band (Mc.)	NR	Stn.	CK- RST	Section	Time ST	Date (Jan.)	NR	Stn.	CK- RST	Section	Time	Date (Jan.)	New Sec- tion as Worked	
50 50 50 144 144 50 420 144 144 144 50 50	1 2 3 4 5 6 7 8  9 10	W1AW	57 43 58 49 57 54 58 57  34 479 589	Conn.	4:15 p.m. 4:35 p.m. 9:09 p.m. 9:30 p.m. 9:50 p.m. 11:30 p.m. 11:35 p.m. 11:45 p.m. 8:50 a.m. 9:18 a.m. 10:40 p.m.	10 10 10 10 10 10 10 10 10 11 11 11	3 7 6 32 15 11 30 21 18 7 12 20	W1PHR W1QAK/1 W1KCS W10OP KN1DDO K21EJ/2 W1PHR W3CGV W9WOK W1RFU W6AJF VE3AIB	47 59 359 58 58 48 57 59 449 59 379x 569	Conn. Conn. R. I. E. Mass. Conn. N. Y. CL. I. Conn. Md,-Del,-D. C. Ill. W. Mass. S.F. Ontario	4:18 p.m. 4:40 p.m. 9:11 p.m. 9:36 p.m. 9:46 p.m. 11:32 p.m. 11:35 p.m. 11:56 p.m. 12:34 a.m. 6:20 a.m. 10:35 p.m.	10 10 10 10 10 10 10 10 11 11 11	1 2 3 4 5 6 7 8 9	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Claimed score: 23 points × 19 (9 + 10) = 437. Bands Used: 50, 144 and 420 Mc. 9 sections worked  Names and calls of operators having a share in above work.  Participating for club award in the														

EXPLANATION OF V.H.F. SS CONTEST EXCHANGES									
Send Like S Msg. Pred		Call	CK	Place	Time	Date			
Exchanges Contest numbers 1, 2, 3, etc., a new NR for each station worked			(Readability section tra		Send time of transmitting this NR	Send date of QSO			
Purpose (example)	QSO NR tells how you are doing (NR1)	Identification (W1AW)	RS or RST report (589)	See page six for section list (Conn.)	Time and date contest period Jan. 10)				

section where at least three such licensees submit valid logs. Clubs are invited to get their members on the air from their individual stations to complete for the certificate issued to the leading operator in each club. The club whose members pile up the top aggregate score will also receive a handsome cocobolo gavel with a sterling-silver band engraved with the name of the winner.

Contest reporting forms are now available from the ARRL Communications Department on request. If you don't use these log sheets, please follow the log arrangement shown. ARRL welcomes all contest reports to assist in the checking and to make complete results in *QST* possible. Novices and Technicians: be sure to report your totals, large or small, so that the license-class leader in your section can qualify for a certificate.

The last V.H.F. Sweepstakes was history's hugest v.h.f. contest, with nearly 1200 amateurs joining in the fun. Why not look over the results of that one in April, 1958, *QST* for an idea of your local competition. Then stand by to give the gear a real workout January 10 and 11!

#### Rules

- 1) Eligibility: Amateur operators in any ARRL section (see page 6) operating at home, or mobile or portable under one call on or above 50 Mc. are invited to take part.
- 2) Object: Participants will attempt to contact as many other stations in as many ARRL sections as possible.
- 3) Contest Periods: The contest starts at 2:00 p.m. your local time, Saturday, Jan. 10, 1959, and ends at midnight, Sunday, Jan. 11, 1959. Contacts between stations in different time zones can be counted only when the contest period is in progress in both of the zones concerned.
- 4) Exchanges: Contest exchanges, including all data shown in the sample, must be transmitted and receipted for as a basis for each scored point.
- 5) Scoring: (a) Contacts count one point when the required exchange information has been received and acknowledged, a second point when exchange has been completed in both directions.

- (b) Final score is obtained by multiplying total contact points by the sum of different ARRL sections worked (the number in each of which at least one SS point has been credited) plus 10.
- 6) Conditions for Valid Contact Credit: (a) Repeat contacts on other bands confirmed by completed exchanges of up to two points per band may be counted for each different station worked. (Example: W1HDQ works W1RFU on 50 and 144 Mc. for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only one section multiplier.)
  - (b) Cross-band work shall not count.
- (c) Portable or mobile station operation under one call, from one location only, is permitted.
- (d) A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest period.
- (e) Contacts with aircraft mobiles cannot be counted for section multipliers.
- 7) Awards: Entries will be classified as single- or multi-operator, a single-operator station being defined as one manned by an amateur who neither receives nor gives assistance to any person during the contest period. Certificates will be awarded in each ARRL section to the top-scoring amateur in the single-operator classification. In addition, a certificate will be awarded to the top Novice and Technician in each ARRL section where at least three such licensees submit valid contest logs. Multioperator work will be grouped separately in the official report of results in QST.

When three or more individual club members compete and submit logs naming the club with which they are identified, an ARRL certificate will be issued to the leading club member. When less than three individual logs are received there will be no club award or club mention.

A gavel with an engraved sterling-silver band will be offered the club whose secretary submits the greatest aggregate score, provided such scores are confirmed by receipt at ARRL of the individual contest logs from such members. Only the score of a bona fide club member, operating a station in local club territory, may be included in club entries. Claims from federations, radio club councils, or other combinations of radio clubs, will not be accepted, nor can special memberships granted for contest purposes be recognized.

- 8) Conditions of Entry: Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.
- 9) Reporting: Reports must be postmarked no later than Jan. 28, 1959, to be considered for awards.

## Strays

The Air Force MARS Eastern Technical Net (Sundays 1400–1600 EST on 3295, 7540 and 15,715 kc.) will offer the following during December:

Dec. 7 — Navigation by Electronics

Dec. 14 — New Concepts in Communication Systems

Dec. 21 — Uni-Directional Antennas

Dec. 28 — Impact of Solid State Physics in Electronics.

Each program will feature a speaker from the Rome, N. Y., Air Development Center.

Check your Call Book — you'll find that K5LNV is a real Texas call.





#### TWO-METER GROUND PLANE

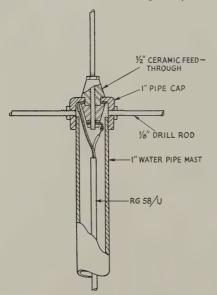
THE two-meter ground plane antenna described ■ here is not only inexpensive but also has good appearance qualities generally nonexistent in ham-band antennas.

Construction is simplicity itself. A standard one-inch pipe end cap available at any bardware store makes up the base. A hole large enough to receive a 1/2-inch ceramic feed-through insulator is cut in the top of the cap and four equal-spaced ½-32 tapped holes are made in the flange. These holes should be at least  $\frac{1}{2}$  inch from the edge of the flange to avoid thread damage when the mast is screwed into place. The holes should be drilled with a press if possible to assure perfect alignment.

Next, five pieces of \( \frac{1}{8} \)-inch drill rod are cut to length. We used the formula from the Handbook to determine the required length. Four of the rods are threaded for ½ inch and the fifth is threaded approximately  $1\frac{1}{2}$  inches.

Prepare the coax feed line as shown in the sketch. We used a solder lug with 5%-inch inside diameter for the shield and a 1/8-inch solder lug for the center conductor. Assemble the vertical, the rod with the long thread, as follows: First, a self-locking nut goes on, then the top half of the insulator. Slip this into the top of the pipe end from the outside, followed by the shield conductor lug, making sure the surface of the inside of the cap and the lug make good contact. Install the other half of the insulator, followed by a

Fig. 1—Details of the two-meter ground plane.



washer, the center conductor terminal and a nut. Tighten the assembly with the self-locking nut on the outside to avoid twisting the conductor.

Now run a self-locking nut on each of the four remaining rods. Screw the rods into the holes around the flange and tighten up on the nuts. We use a piece of one-inch water pipe 25 feet long fastened to the side of the house at the bottom and at a point six feet from the bottom. No guy wires are needed and no feed lines are visible.

No electrical measurements of the performance of the antenna have been made here, but from an operating standpoint its performance is outstanding.

— Dale Westfall, K\(\theta\)GNP/4

#### TUNING THE HELIWHIP TO FREOUENCY

Many of us would like to tune the "Heliwhips" to frequency but don't like the idea of unwinding turns to raise the frequency of resonance. Tuning can be done very easily by winding a sleeve of aluminum foil so that it covers a few turns at the bottom of the tightly wound portion of the whip. After the correct number of turns have been covered, wind plastic tape over the foil for protection.

If the desired frequency is lower than the natural resonant frequency, tape containing ferrous material, such as audio recording tape, might be tried.

— Milford W. Noe, W6IMW

#### DON'T CLEAN CERAMIC MATERIAL!

EEPING equipment clean plays an important K role in routine equipment maintenance. However, care should be exercised when using solvents such as alcohol, carbon tet, or other wax dissolving substances around ceramic material such as steatite, isolantite, etc.

Most ceramic material used in switches, tubesockets and the like are impregnated at the factory with a waxy substance. This prevents moisture from collecting in the small pores of the material. When this substance is removed by the cleaning solvent, the voltage breakdown point of the material is decreased, leakage may develop. and general insulating quality, especially at high frequencies, will suffer.

#### Q MULTIPLIER FOR BC-312 OR BC-342

HERE is a hint for users of the BC-312 or BC-342 who wish to use these receivers with the Heathkit Model QF-1 Q Multiplier. The QF-1 will not tune to the BC-312 i.f. of 470 kc. To make the conversion refer to the QF-1 schematic and you will see a 3300-μμf. silver-mica

capacitor in the tank circuit. Replace this capacitor with one with a value between 2800 and 3000  $\mu\mu$ f., and retune the inductor to 470 kc. by adjust-

ing the tuning slug.

Using a 2800- $\mu\mu$ f. ceramic capacitor, the circuit came to resonance with the slug almost all the way in; so, if normal tolerances will not permit tuning to resonance at 470 kc., try a capacitor of 3000  $\mu\mu$ f. Although I used an available ceramic capacitor which works very well, it is possible that the recommended silver-mica unit would improve the selectivity and Q. As it is, with the BC-312 series having such broad selectivity, the Q multiplier is a welcome addition when the going gets rough.

— Harry K. Long, W7CQK

## SQUELCH CIRCUIT FOR HALLICRAFTERS S-85

An increasingly useful feature of some communications receivers is a circuit used for silencing the receiver when no signal is being received. However, many recent receivers do not incorporate this feature. The schematic (Fig. 2) shows a squelch circuit which can be used with the Hallicrafters S-85, simply by plugging the unit into the socket provided for the 6H6 a.v.c., a.n.l. and detector tube. The circuit, which requires no modification of the receiver whatsoever, is simple and quite effective.

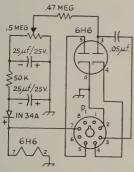


Fig. 2—Squelch circuit for the S-85. All resistors are  $\frac{1}{2}$  watt.

A variable negative bias voltage is obtained by rectifying filament voltage. This is accomplished by feeding the filament voltage to the cathode side of a 1N34A and applying the negative voltage to a filter circuit. Note that the positive end of the electrolytic capacitors is grounded. The load resistor for the bias supply is a 500K pot which allows the bias voltage for the 6H6 to be varied.

A blocking capacitor in the plate of the noise limiter section of the 6H6 (which serves as the squelch tube) isolates the a.v.c. bus from the plate, thus allowing external negative bias to be applied without biasing the r.f. and i.f. tubes to cutoff. The audio input to the circuit is taken from this capacitor.

The cathode of the a.n.l. section of the 6H6 is connected just as it is normally in the receiver. This connection applies a.v.c. voltage to the cath-

ode in the presence of a signal, and also serves as an audio output for the circuit.

The circuit then operates as follows: The variable negative bias obtained from the bias supply is applied through an isolation resistor to the plate of the a.n.l. section of the 6H6, making the plate negative with respect to the cathode. In this condition, the diode does not conduct and no audio is heard from the receiver. When a signal is present, the a.v.c. voltage applied to the cathode makes the cathode more negative than the plate and the diode conducts, passing audio. Since the plate bias voltage is variable, the signal strength required to operate the squelch circuit can be adjusted. Running the squelch control about one-third open will squelch the receiver noise in most cases.

The entire unit can be built into a small Minibox. An octal socket is mounted on one end of the box with an octal plug,  $P_1$ , on the other. The squelch control is mounted in the center of the box. In operation, the entire unit is plugged into the 6H6 socket in the receiver and the 6H6 is then plugged into the top of the box.

Once the unit has been plugged into the receiver, it is only necessary to throw the a.n.l. switch to its on position to place the squelch in operation. Squelch level is determined by the setting of the squelch control on the unit. If it is desired to operate the a.n.l. circuit as intended without the use of squelch, the squelch control is set at minimum. This removes all bias from the plate of the a.n.l. circuit and allows it to function normally. To remove squelch or a.n.l. functions from the receiver, simply turn the a.n.l. switch to its off position.

- Brace L. Mackey

#### KEEP IT CLEAN

Users of forced air-cooled tubes such as the 4X150, 4CX250B, PL172, etc., should pay attention to the small print on the tube data sheet which says, "Clean the air system periodically." The blower blades in particular will pick up quite a bit of dust and lint which becomes packed between the blades, with the result that the output of air and the life of expensive tubes are reduced considerably. A pipe cleaner moistened in water is ideal for cleaning both the blower blades and the cooling fins of the tube. Cleaning should be done every two months.

— Melvin Leibowitz, W3KET

## A TRANSISTORIZED TUNABLE CONVERTER

While it is perhaps cheaper to build a converter using tubes, it is very interesting to try the same project using transistors. The transistorized version can be used with a transistor car receiver with no power problems, and is small in size. The converter described here is designed for fifteen meters, mainly because ten meters is still hard to hit with inexpensive transistors, and the lower frequency bands have quite a bit of QRM. There is no reason, of course, why the converter could

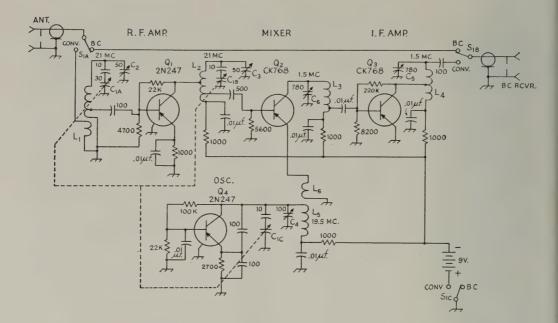


Fig. 3—Circuit of the Transistorized Tunable Converter. Unless otherwise indicated, capacitances are in  $\mu\mu$ f. resistances are in ohms, resistors are  $\frac{1}{2}$  watt.

 $C_1$ —30- $\mu\mu$ f. 3-section variable capacitor (three-ganged Cardwell type PL-6003 trim-air midgets).

 $C_2$ ,  $C_3$ —50- $\mu\mu$ f. air trimmers.

 $C_4$ —100- $\mu\mu$ f. air trimmer.

C<sub>5</sub>, C<sub>6</sub>—780- $\mu\mu$ f. mica trimmers.

L<sub>1</sub>-9 turns No. 22 enam., ¼ inch long, ¾-inch diam.,

tapped 3 turns from cold end. Link is one turn No. 22 enam. wound near cold end of above coil.

L2—12 turns No. 22 enam.,  $\frac{1}{2}$  inch long,  $\frac{1}{2}$ -inch diam., tapped at 2nd and 7th turn from cold end.

L<sub>3</sub>, L<sub>4</sub>—No. 32 enam. close-wound, ½-inch diam., 1 inch long, tapped 20 turns from cold end.

 $L_5$ —7 turns No. 22 enam.,  $\frac{1}{2}$ -inch diam.,  $\frac{1}{4}$  inch long.  $L_6$ —4 turns No. 22 enam., close-wound  $\frac{1}{4}$  inch above top

of  $L_5$ .  $S_1$ —3-pole 2-position rotary switch (Centralab PA-2007).

not be built for the other bands just by changing the coils.

The converter is of the tunable type with a fixed output frequency somewhere in the broadcast band (in this case, 1500 kc.). The ultimate performance obtainable from this type of converter is higher than from the fixed-frequency type because the front end need not be broadbanded. The converter is powered by a small 9-volt battery mounted inside the case, and since the total current drain is less than 3 ma., the battery should last for quite a while.

No particular constructional details are needed; the layout can be left up to the individual constructor.

The circuit used for the oscillator is a Colpitts. Stability was hard to come by when using a transistor at 19.5 Mc., but after many circuit modifications, the oscillator drift was cut down to about 5 kc. in a half hour from a cold start. It was found necessary to use a high-C circuit in the oscillator to get any usable stability at all, and the size of the base bias and emitter stabilizing resistors radically affected the performance of the oscillator, while changes in the base loading resistor did not have too much effect. One peculiar thing observed about the oscillator was its extreme sensitivity to temperature changes; heat from a quick touch of a soldering iron would send it

drifting many kc. It was found that the oscillator could be made to drift noticeably by simply blowing on it. In the finished converter, every effort was made to keep the temperature stable.

The mixer operated best with absolutely no bias at all, which is not too surprising since that must be its most nonlinear condition. By vacuum tube standards, a lot of local oscillator injection was required. Several methods of injecting the signal were tried, but the method shown here reduced the "pulling" of the local oscillator when tuning the mixer to a minimum.

The r.f. amplifier is straightforward, with the size of the bias resistor being the most critical item. The base had to be coupled near the bottom of the coil before the base tuned circuit would have any selectivity at all. This tuned circuit was very easily loaded by the antenna, and one turn in the primary seemed to give maximum signal transfer and front-end selectivity.

The i.f. stage was thrown in as an afterthought, since an old automobile broadcast set was used. However, the converter had gain to spare, so there was probably no real need for this stage. The method of coupling this stage to the car receiver was determined purely by experimentation, and may require a little modification with other types of receivers.

- H. A. Ross-Clunis, jr., W6GRZ

# PUSH-TO-TALK FOR THE COMMUNICATOR I AND II

Mobile operation using the Communicator I and II can be made much safer and more convenient by adding a push-to-talk circuit. All that is required is a solenoid, a spring, and a couple of screws. Drill holes in the send-receive knob and in the bottom of the Communicator cabinet. Connect the spring (an old dial spring will do) to the send-receive knob and to the-screw that holds the tuning eye shield to the cabinet. (see Fig. 4). Mount the solenoid (which can be obtained from an old pinball machine.) on a bracket and screw it to the bottom of the cabinet. The solenoid can be keyed by the push-to-talk switch in the microphone.

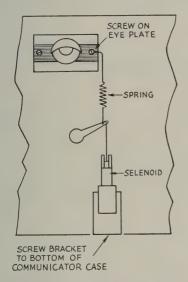


Fig. 4—Sketch showing details of Communicator I and II push-to-talk feature.

When you decide that it's time to trade in the Communicator, remove the spring and solenoid and all you have is a scarcely-visible screw hole in the cabinet bottom.

— E. V. Blaize, jr., W5TVW

# SERIES OR PARALLEL TUNING WITH THE HEATH AC-1

One of the shortcomings of the Heath AC-1 antenna coupler is that it is parallel tuned only. This sometimes makes it difficult to feed certain antennas.

However, the coupler in use at KN3BZI was very easily modified for both series and parallel tuning with a minimum of extra components. All that was used was a d.p.d.t. toggle switch and some Scotch electrical tape.

Disregarding the built-in low-pass filter switch and output indicator, which are not affected by the modification, the effective circuit of the AC-1 is shown in Fig. 5.

In this circuit, the inductance  $L_1$  and the transmitter link  $L_2$  are in series. The combined in-

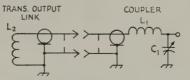
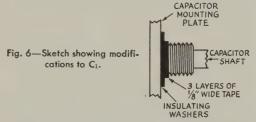


Fig. 5—Basic diagram of the AC-1 antenna coupler.  $C_1L_1$ —Original AC-1 capacitor and inductance.

ductances are then a parallel-tuned circuit with respect to capacitor  $C_1$ . All that is needed is insulation of rotor  $C_1$  from the chassis and provision for a method of switching the circuit to insert  $C_1$  in series or in parallel with  $L_1$  as desired.

To insulate the capacitor, the coupler is removed from its case and  $C_1$  is removed from its mounting hole in the front panel. The bushing for the rotor is insulated by making several washers of electrical tape or other thin insulating material. The washers are cut so that the center hole is a snug fit over the bushing. They are then slid over the bushing to the front mounting plate on the capacitor. After the washers are in place two or three wraps of tape are made around the bushing. The tape should be slightly wider than the thickness of the front panel. This is shown in Fig. 6.



The mounting hole is then enlarged sufficiently to allow the tape to go through, and the capacitor is replaced in the panel. Several more of the washers are then placed over the bushing and pushed against the panel. These should be large enough to prevent contact between the panel and the lock nut of the capacitor.

After the capacitor is completely insulated from the cabinet, the leads from the coil to the capacitor are removed from the capacitor and the lead from the neon bulb is removed from the coil. A d.p.d.t. switch is mounted where convenient (at KN3BZI the output indicator was moved from the panel to the back of the cabinet and the switch mounted in its place). The switch is then wired as in Fig. 7.

(Continued on page 188)

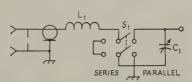


Fig. 7—Circuit of the antenna coupler with series-parallel tuning feature added.  $C_1 L_1$ —Original AC-1 capacitor and inductance.

S<sub>1</sub>—D.p.d.t. switch.





Left: In the background the Yasme II, in the right foreground the "shack" (which seems to be aptly named in this case), and to the left is the dinghy and kicker. And everywhere, birds. Right: Aves Island (the English equivalent of which is Bird Island) is a bird sanctuary. As you can see from this picture, there are many, many birds present. Danny says that when gazing at the stars it is a good idea to keep your mouth closed.

# YASME II to Aves Island

BY DANNY WEIL,\* VP2VB, YV0AB

The suggestion that I go to Aves Island and operate wasn't greeted with very much enthusiasm when I found out a few things about the island.

Even the fact that I would be accompanied by three other hams (Jules, KP4AIO, Julio, YV3BS, and Falke, YV5GO, were my companions and assistants both on the voyage and operations ashore) made little difference in my attitude. It was also brought to my attention, forcibly, that this was the hurricane season (July to October) . . . well!

I went over and visited retired Air Force Colonel Henry, KV4BZ, who lives aboard his converted sub-chaser at Yacht Haven, St. Thomas, and who has sailed extensively in these waters. I listened to his opinions and we looked at the charts. At first he had difficulty finding a chart with Aves on it but finally he found a large one with an inset of Aves. I felt even worse about the deal!

I have had the job of finding tiny islands, but never anything like this. It is 1500 feet long and 150 feet wide, maybe. Its height was a moot point, but somehow I couldn't get the colonel to raise it much more than six feet above sea level.

The colonel had been to Aves the year before. He had been attracted by a column of smoke and, upon going ashore, discovered two natives and a white man who had been there 42 days and who were almost dead. Apparently a fishing schooner had set them ashore for turtle hunting, a gale had come up and the schooner had to get out fast. The schooner either got sunk or just forgot about the men — no one seems to know — but that was the last the men saw of it. The poor blighters were on the last of their water and

must have had a heck of a time with nothing to keep them company other than birds, turtles and crabs. No water is available on Aves nor are there any trees.

Dick, KV4AA, had spent several days constructing a cabinet that would house the HT-32, HT-33 and SX-101 so that it was completely self-contained and could be bolted to a prepared spot on *Yasme* and then unbolted and taken ashore. It was built like a battleship, and weighed like one too, but we both knew it would stand all the bashing I could give it without falling apart and so was good protection for the equipment.

Food was another problem. I have only had myself to cater for in the past, and to please three others was a problem. After all, maybe they wouldn't like my homemade bread which needed a hacksaw to cut it, and perhaps canned Spam with a fine rich kerosene flavor wouldn't be to their taste. Anyway, with the aid of Dick's XYL, I finally got a load of chow which should have satisfied anyone.

Stowing it was the next problem. Every cupboard was full of hardware, etc., but as eggs and bread weather none too well on deck, I had to move my ropes and wire to other places. We had found a refrigerator to stick aboard and that helped considerably. At least, we did have fresh meat daily and the butter was in one piece instead of being a gooey mess. A supply of cokes filled the refrigerator to capacity.

I was a bit worried about water. My tank only holds 30 gallons, so a general round-up was made here for spare bottles to augment the supply. My main tank also is a little rusty inside and every cup of water is flavored with ½ cup of rust. I didn't mind it, but the other guys complained — some people are never satisfied!

KV4BZ had fixed me up with all the charts required for the trip. Many were never used, but I

 $<sup>\</sup>ast$ e/o Richard C. Spenceley, KV4AA, Box 403, Charlotte Amalie, St. Thomas, Virgin Islands

thought it might be a good idea to have others in the event of my missing the island altogether which, incidentally, I thought I would.

Seemed to me we had everything except good weather, but I'm getting so used to bad weather now that to have a really fine day for sailing would startle me! The usual customs and immigration formalities being taken care of we shoved off from St. Thomas at 3 P.M. on July 3.

I had a final check on all the gear as we stooged around in St. Thomas harbor. Two Onan generators, two SX-101, two HT-32, HT33, stacks of tubes etc. and countless feet of wire of assorted sizes. Everything seemed to be there and I chased the lads around to make sure they had lashed everything down. They just didn't know what was coming, and neither did I!

Clearing the harbor, I laid course for St. Croix, forty miles to the south. Severe cross seas and a 30-knot beam wind made the trip to St. Croix

fast and rough.

Fredericksted, St. Croix, was flat calm and very quiet when we arrived at midnight. A soft glow came from the lights ashore and, apart from the rattle of the anchor chain as we dropped the hook, nothing broke the silence. We just couldn't believe that only 15 minutes ago we had been in ten-foot seas with a howling wind and all their attendant discomforts.

Early the next morning (I guess it must have been around 7 A.M.,) I stuck my neck out and looked around. As per the night before, everything was serene and calm and I really thought we should

have a pleasant voyage.

With breakfast out of the way, we spent a while picking up assorted bits of gear, clothing, etc. which had fallen in odd spots during our short passage. Never did I realize that so many things could hide in so many obscure places. By 10 A.M. we were underway, out into a half-gale and heavy seas.

Right through the day and night Yasme plunged on, the auto pilot holding her to a course which none of us could have maintained for any length of time. Sea sickness had taken its toll from each and everyone of us and, to put it nicely, we all wished the boat would sink and put us out of our misery. Julio and Falke slept through the worst of it. Boy! they must have had cast-iron stomachs!

Another day dawned and we checked the log trailing astern. The sun was hidden by heavy overcast while we listened to our weather net friends, at 7 A.M., telling us the weather was wonderful. 10 A.M. came along, as usual, and with it a hazy sun poked its way through the murk to shine on 20-foot seas. Somehow I wedged myself on the cabin top and took sights. Jules staved in the shelter of the doghouse, noting down times and angles as I called them out. I guess I must have taken about eight sights before the sun decided to quit again. I knew these sights would only give me a position line but even that would be welcome. I never did get any sights at noon but, with those already taken, I figured Aves was still about 70 miles away.

After a night's close watch on the depth finder

the morning dawned dry but windy with seas breaking over the boat and giving us our usual ducking via the leaks in the hatches. Somehow we managed to keep the rigs dry. At 8 a.m. with a fairly clear sky Jules stood by while I took repeated shots of the sun. Further sights taken at 10 a.m. gave me a position 12 miles off course. A final check at noon would finalize my latitude.

Old Sol climbed to his highest perch and then climbed down again but I grabbed his angle before the clouds finally crowded in. I rushed below and within ten minutes had our first set of sights worked out. Not satisfied with this, I worked out another, and yet another. All of them tallied within a half mile and gave us an exact position. I told the lads my new course, set it and then said, with tongue in cheek, "Aves will come up, dead ahead, two hours from now."

The first hour went by with maddening slowness and the log read five miles more. Aves should be visible now, only four miles off, but it wasn't. I lugged out the binoculars and strained my eyes but no Aves. Each of the boys had grouped themselves by the bow and on the cabin roof but still no Aves.

There was nothing to do now but to climb the mast and make absolutely sure. It had to be there!

At first I wasn't sure. I called down to the lads "Either that is Aves dead ahead or I'm crazy." It was Aves. A!l that could be seen was a faint

This is the main operating position aboard the Yasme II, showing the equipment cabinet which is unbolted and taken ashore at most stops. The operator sits on the diesel engine housing.





Canvas shack, Hallicrafters gear in the background, beaucoup sand underfoot.

Jules, KP4AIO, knocks off the contacts as Danny watches.

sandy smudge on the horizon which would appear and disappear as the *Yasme* rose and fell in the high seas.

With the depth finder flat out we crept in as close as possible to the beach and away went the anchor. Directly the way was off the boat she started to roll. It gradually built up so that the bubble in the inclinometer hit the side of the tube at 45 degrees.

From what we could see of the island it consisted of a low sandy strip with rocks on the lea shore and a steeply sloping sandy beach on the windward. Big breakers crashed over the rocks on the far side, but here on the so-called lea of the island, a cross sea built up as the waves swept around each side of the island and met directly at the point of our anchorage.

There was a native schooner anchored nearby, which had come from St. Lucia on a turtle hunt. It had already been there ten days with little luck, having only nabbed four turtles. The skipper came aboard the *Yasme* and advised friends in St. Lucia, via VP2LB, of his whereabouts. As it was getting late in the afternoon I decided I would reconnoiter in the morning and prayed for a calm.

At 7 A.M. we were all up and put the dinghy over the side. Ignoring the three fenders I had put there, it immediately scored the topside paint and started bashing itself to pieces. I managed to jump into it and shove it clear of Yasme. I then rowed over to the schooner and, with the help of three of its crew, managed to get aboard without wrecking the dinghy or drowning myself.

The schooner's skipper was a typical Frenchman and told me of the hazards of the place. I didn't need much convincing. He said that the weather had been bad all the time and it was with great difficulty that he had been able to get his turtles aboard, even with six strong men to handle his boat. It was then that I realized it wasn't going to be an easy matter to get our equipment ashore without losing or damaging it.

I then invited him over to the *Yasme* and after a cold beer (several, in fact) he offered to help us with the gear using his own dinghy and crew.

I won't go into details about the agonies of extracting the equipment from the interior of the Yasme and getting it on deck. Nor the trouble of lowering it over the side into his boat. Can anyone imagine loading stuff in a dinghy when at one

moment it is level with the deck and the next second ten feet below it!

The SX-101 and HT-32 were man-handled into the boat but the Onan 1500-watt generator was too much and I decided to use the winch and my dinghy davit to lower it. Directly that thing left the deck and became suspended in mid-air it turned itself from a harmless generator into a 200-pound lethal weapon. Four of us struggled on the heaving deck to control it. With attempts to keep from falling overboard plus trying to avoid being smacked with the swinging generator, or letting it hit the boat, we finally got it into the dinghy. Now came the business of getting it ashore.

Those St. Lucia boys really knew their business though. We waited just outside the line of surf for the opportune moment and then they really bent their oars and went full out for the beach. Within fifteen feet of the shore line two of them jumped out into waist-high water and grabbed the boat, and as the next sea swept in, the rest of the crew jumped out and manhandled the boat up on the beach using each successive surf to assist them.

I helped carry the gear above the water line and we all shoved off back to the boat for the next load. Within three hours we had all the gear ashore except the HT-33 amplifier and I decided that the risk involved was too much to even attempt lowering it over the side let alone getting it ashore. Hovering in the back of my mind was the thought that all this gear eventually would have to be brought back to the Yasme without their help. I was glad of my decision later.

Up to this point I have made little mention of the island other than its general appearance physically. The first thing that struck us were the birds. Never in my life have I seen so many birds in one place. The island was literally blanketed with them and one had to step carefully to avoid either stepping on the grown birds, the chicks or the eggs.

As we moved our equipment to a reasonably clear spot, the birds would scare into the air screaming vengeance, and one would have to wave his arms to prevent them from attacking. We could stand over one of the birds, as it protected its eggs, and it would do nothing but scream and plunge its sharp long beak at us.

Jules set up the couple of pup-tents he had brought along and while they gave good protection from the rain and wind they were hardly suitable for holding all the rigs and still give room to operate. However we were mighty anxious to put YVØAA/YVØAB on the air and very soon we had the HT-32 ready to go.

During the 1958 Aves expedition a new 40-foot metal mast had been erected with a large metal Venezuelan flag mounted at its peak. This was to be our antenna mast. Aboard we had a selec-

(Continued on page 198)

If you're not careful these days on 6 meters, you're likely to run across a QSO that sounds something like this:

1st Lid: Hey, man, you get a real strong signal here — I'd say 'bout 20 db. over S-9 — but boy, your modulation is a mess! Sounds like you must have some kinda trouble over there. You better check that, wot say? Break break break.

2nd Lid: Break break break. Ain't nothing wrong with my audio. You just ain't got me tuned in right. I'm using phrase modulation. You gotta tune me in off at one side. Howsit sound now? Break break break.

1st Lid: Break break break. Oh, I gotcha now. Fine business. Well, I got one of them new Globe Scout 680's and they use hydrogen modulation. But I don't use that just by itself — I got me a WRL lineal amplifier the other day. Howeit sound over there? Break break break.



2nd Lid: Break break break. Oh, man, you got a real fine business signal over here. I don't have an S-meter here but I'd say your signal was about 60 db. over S-9. I'm using a Gonset barefooted, and they don't have S-meters. Say, I thought about getting one of them lineal amplifiers but they tell me they get pretty hot and I couldn't figger out how to mount one of them fans to take care of the heat participation. Whatchou using for a receiver over there? Break break break.

1st Lid: Break break break. Receiver here is one of them war surplus Commando sets. It ain't got a S-meter on it either but you're a good S-9 (He just found out that Gonset is barefoot, so he's revising his signal report—ED.). Yeah, you got a good solid signal here. Whatchou using for an antenna over there? Break break break.

2nd Lid: Break break break. I got one of them three-element tellerex beams with a grammar

# The Perils of Six Meters

BY ROBERT SEALS \*, K9AHK

match. By the way, your signal seemed to drop off on that last transmission (*He's burning over that S-9 report*—ED.). What kinda antenna you using over there? Break break break.

1st Lid: Break break break. I'm using one of them all-band wisdom antennas and it seems to be doing a pretty job for me here. Well, old man, your signal was pretty far down in the mud on that last transmission, too. I guess the ground wave ain't working too good tonight (They're a half a mile apart—ED.). So I guess I better say the very best of 73s and it's been a real fine business QSO. So the very best of 73s and hope to work you on the band again in the very near future. 73s, old man.

2nd Lid: Fine business, old man, and the very best of 73s to you, too. It's been real fine working you and hope to see you around the band in the very near future. So the very best of 73s and lots of good luck. 73.



1st Lid: Fine business, old man. 73s and I'll be seeing you. 73.

 $2nd\ Lid\colon$  O.K., ole buddy. 73 and I'll be seeing you. 73.

(ED. NOTE: If you aren't completely numb by this time, you reach over and turn the dial as the 73s go ping-ponging back and forth far, far into the night.)

\* 1922 Sedgwick Street, Chicago, Illinois.

### Strays

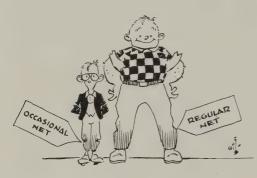
K9KIM suggests that we'd all be interested in an inexpensive stamp dispenser for coiled stamps, now available for about a nickel from the Post Office Department. It holds a coil of 100 stamps, which feed out through a slot in the side. Real handy for those who QSL.

# Originating Message Traffic

#### Some Ideas on Traffic Sources

Somebody has to originate traffic, else we shall all report QRU: "I have nothing for you." As it is now, far too many of us reporting into the section nets, night after night, come empty handed. Fortunately for those who bring no traffic, there are relaying and delivery assignments to engage a few, but not all. The services of these men are needed and most welcome. But it saddens the net control station to hold any man idle on a dull evening and finally dismiss him with nothing to show for his time.

The purpose of this article is to encourage the fullest possible participation in your ARRL section's net sessions. A good way to begin is to bring a message. One message originated by each reporting station would be healthier for the net and more fun for everyone than a big load from just one station.



You may think that message origination is not for you. You live in an isolated rural district. Your work is of a solitary sort and you are denied daily contacts with a variety of people in offices and in cities. Or perhaps you feel that you can't originate anything important enough. That touches the delicate matter of message content. What is this stuff we handle? Is it worth doing? The answer is a solid yes. It is not for us alone to decide the worth of a message. To be sure, the thrill of handling priority traffic — especially emergency traffic - is something to remember, but it is the large, steady volume of routine messages which creates the vehicle that makes a network efficient in emergencies. That volume becomes the "carrier wave" on which emergency traffic may ride. And when emergencies do arise, it will be the regular traffic nets that will be most ready and able to handle them.

Well then, how may we begin? Let us list some general types of messages. There are the "occasional" greetings: Christmas, Easter, Mother's Day, Thanksgiving Day, Valentine's Day. There are personal greetings for birthdays, anniversaries.

birth announcements and messages to convalescents; congratulatory messages to nieces for making the honor roll, to kid cousins for getting their Wolf badges in Cub Scouts; to winners of contests and competitions; and to those elected to membership or to offices in business, social and civic organizations. There are acknowledgements of receipt of letters, packages, gifts and there are inquiries concerning the receipt of these, too. There are inquiries and notifications about safe arrivals and planned departures of travelers. There are notices of moves to new addresses. There are replies or acknowledgements indicated by the texts of the messages which we have just delivered locally. And within the framework of ham radio itself there are messages of proposed schedules for time and frequency for QSOs and of confirmation of the same. Surely, with all these kinds of messages and more, let no one admit that he can't originate traffic.

With all these kinds of messages in mind, who then will become the sources and the senders? I suggest we start at home, in our own households; next with those friends who have shown some sympathetic interest or curiosity in our hobby and with any neighbors whom we have not irrevocably alienated by TVI. Indeed, through message soliciting I have converted one neighbor who suffered from aggravated TVI into a fair traffic client. And, finally, there are the larger groups we meet in school, at the office, and in the myriad other activities we have. Even my barber (I am his captive and he is mine for twenty minutes on Saturdays) is a message client.

So it appears that the only practical limits to our sources for traffic are the degree of enthusiasm and alertness we bring to the task and the amount of time we give to it.

How shall we go about asking for a message? Tell your prospect simply and enthusiastically what we do in our hobby. It is a hobby of service. Tell him how it works. He may have read about

\* 7818 Stratford Road, Bethesda, Md.



the marvels of radio contact with Antarctica, but he has no concept of *nets* and the National Traffic System. Tell him that, even if we might contact a "ham" in Salt Lake City, Utah, or Bennington, Vt., who would accept and deliver his message directly, we can make a more dependable delivery and a more orderly one through the net structure, because this is a vast cooperative enterprise of hundreds of devoted amateurs.

Explain, too, the breadth of our coverage: all of the United States, Canada, Alaska, Hawaii, Canal Zone, Puerto Rico, and military personnel in certain overseas places. Also, for the local and regional net, point out that we can frequently make a quick delivery into towns that we know are regularly represented on the nets.

Make clear to him the probable delivery time in order that he won't expect the improbable and in order to plan far enough ahead on holiday traffic. Suggest the general types of messages we handle; perhaps one of the types listed above may move him to try us out. Demonstrate by your own discretion in not disclosing the content of other people's messages that he can trust you with his own.

When necessary, explain to him that there are some kinds of messages we seek to avoid: debt dunning, fund raising, excessive statements of affection, and critical fault finding. However justified such messages may be, they do not belong on the air. They put the amateur at the delivery end in a very uncomfortable position. In that same connection we should be very chary in originating traffic ourselves, or in accepting from others, for origination by us, messages for fund solicitation, mass appeals for legislative or organized action, or for commercial purposes. None of us wants to be "used." Consideration for our fellow traffic man who has to relay or deliver such material should be our guide.

Let us suppose then that our prospective sender agrees to try us out. More often than you'd expect, he will say: "All right, but what shall I say?" Here you can offer good help in message drafting. Tell him this is a message, not a letter. Keep the text as brief as full understanding will allow. Because the message will usually be telephoned at the delivery end, the phone number should be included if known. Urge the use of simple straight-forward language; avoid veiled allusions and those private expressions that may carry great significance betwixt lovers or within the bosom of a family group, but which become open invitations for garbling in retransmission over a net. Encourage the use of



ARRL stock messages for holiday greetings for brevity's sake.

And now that you have a client, treat him right. Follow up. After an appropriate interval of time, make it your practice to inquire about the fate of the message. Was it received? This is important. For on the outcome of it depends whether or not you can convert a casual first-time message sender into a steady client. So you see how important prompt, careful delivery becomes to the originating station. Perhaps you yourself have followed up only to have him say: "I don't know. He didn't mention it in his letter." And that is where the value of written confirmations of deliveries comes in.

Promptness and accuracy in delivery are not the only things important to the originating station. The very fact of delivery itself is all-essential. If the message is undeliverable, for the love of ham radio send a service message back to the originating station and report. There's no quicker way of killing amateur traffic than not completing deliveries. For thus are dashed to earth the splendid hopes of sender and originating station alike. Even in such instances as non-deliveries you can sometimes win the sender back into the fold by asking him if he will let you send a follow-up inquiry about the first one, requesting an answer.

Finally, after a while you will have built up a list of fairly dependable sources for traffic. Contact them frequently. Your very re-appearance itself will suggest to them some message they could send. Also, look over last year's originations for the corresponding month (you probably will be cleaning them out of your files next month anyway). From these you may seek repeat birthday and anniversary greetings.

Here then is the point and conclusion: you too can originate messages. The suggestions above have worked for me. You will find still other ways and other sources. So come on in and when you can, bring a message with you.

Editor's Note: Another article by W3TN on delivering traffic will appear in a subsequent issue.

## Strays \*

The December schedule for the Army MARS sideband technical net is as follows:

Dec. 3 — International Radio Communication Systems.

Dec. 10 — F. M. Multiplex Stereo System.

Dec. 17 — V.H.F. Radio Propagation. Dec. 24/31 — No net sessions.

Correcting a previous report (see p. 184, Nov. QST), these 2100 sessions and the fundamentals lectures will be on 4030 kc. sideband.

# From Pole to Pole on 40 Watts

BY REV. DANIEL LINEHAN, S. J.,\* WIHWK

ost of the articles that have appeared during the past year or so on the IGY and the U. S. Navy bases in Antarctica have mentioned the activity of amateur radio on that continent. Most of the installations operate 1-kw. sets suitable for maintaining fairly constant contact with the United States and permitting the men in Antarctica to talk with their families and friends. The one exception to this power rating in the past year was KC4USC which transmitted on 50 watts c.w. and about 40 watts a.m. phone.

KC4USC was not at an IGY base, but during

\*319 Concord Rd., Weston, Mass.



The author, W1HWK, at the home station, Weston, Mass.

The shack at KC4USC and operator W1HWK.



The Reverend Daniel Linehan, S.J., is director of Weston Observatory, Weston, Mass., and is also chairman of the Department of Geophysics at Boston College.

Father Dan's field work has taken him to many parts of the world. In 1951-52 he operated geophysical surveys thirty feet beneath the Basilica of St. Peter's in Rome to determine how much of this was natural earth and how much had been placed there by man some twenty centuries ago. This study was to assist the archaeologists in locating the Tomb of Saint Peter.

In 1954 he went to the North Polar area and made some of the first measurements on the ground to locate the new position of the North Magnetic Pole. During this trip, he travelled some 8000 miles on a 70-foot vessel, doubling in brass as radio operator.

He has made three trips to the Antarctic as a consulting geophysicist for the U. S. Navy. His work in Antarctica included measuring the thickness of the ice at possible camp sites, and also measuring the thickness of the ice at the South Pole. His work at KC4USC was of a geophysical nature; to determine the amount of weathered rock that could be removed by bulldozers and how much had to be blasted.

He built his first receiving set in 1916 using the ubiquitous Quaker Oats boxes for the loose couplers. World War I closed him down, and subsequent duties ruled out ham activies for many years. Only in recent years has he managed to get back on the air.

the winter of 1957–58 the U. S. Navy maintained a complement of 21 members of the Construction Battalion Reconnaissance Unit (Sea Bees) and six civilians who were engaged in special studies at a site at McMurdo Sound, Antarctica. Due to the mobility of this group, no heavy amateur radio equipment was provided for, so the writer brought along personal mobile gear normally mounted in a station wagon. There was doubt in the minds of many as to whether or not this power would get very far from Antarctica. We were in for a surprise!

Our first contact was W4VEI/KC4. At first Bob really doubted if we existed, especially an a.m. station in Antarctica. He was about 900 miles from us at the time. A couple of hours later, W7SXP, Don, from Mesa, Arizona, copied us moderately well. At that moment we felt like Marconi must have felt when his first signal came through, but soon we became disappointed by the lack of response to our CQs and the "no acceptance" when we answered someone else. Then came the dawn (excuse me, "Don"!)

One of the more geometrically minded members of our party, Don Ball, began cutting out

pieces of paper to form great circle bearings; weather balloons were borrowed from the aerologist and covered with crayon marks; formulae from every book that could be found were appealed to; and finally we were convinced that the bearing of our beam could not have been worse if we had pointed it straight into the ground and covered it with damp earth. When we finally changed our bearing from 11° to something in the order of 120°, we heard more American stations and fewer Chinese. We went to work about the second week in January.

During the last three weeks of January, 1958, that we operated with this new bearing, we completed over 115 phone contacts; we transmitted some 50 messages and received 30 or more. We were able to copy traffic for KC4USV which was down at the time, and the messages could be delivered by helicopter pilots who flew to us now and then from that base about 50 miles away. Because of camp activities we were limited

to about three operating hours a day.

One night the big thrill came when we heard a CQ from KL7FLA, an Ice Survey Station 312 miles from the North Pole. I looked at Marion Smith, our radio man 1st class, and said, "Shall we give him a try?" Smitty's doubtful and shrugging response was "What can we lose?" When Vern came back with the statement that we were "coming in loud and clear", we sat back for a nice QSO from Pole to Pole on 40 watts. Vern even conducted some third party traffic with a mutual friend, Father Cunningham, S.J., a veteran missionary in Alaska. After a contact like that, one sits back and complacently realizes that there are no more worlds to conquer.

Our radio equipment consisted of a Gonset G-66B receiver and a G-77 transmitter. The receiver worked from the 115 volts supplied by the camp generator, and the transmitter was fed by a 12-volt battery. We kept this latter at peak voltage with a power supply built by W1DTA before we left the States. The main asset, however, in utilizing all of the available power was the beam. Telrex of Asbury Park, New Jersey, built a two-element beam for us which was tuned for 14.25 Mc. It was a full sized 2-element Yagi with a gain of 5.5. db. The coaxial feedline ran through the main boom, which not only kept it away from the driver, but gave us a mechanical means for turning the beam when required — the way a farmer steers

Our camp location was one of the few places within 800 miles of the South Pole that is free of ice and snow during the Antarctic summer. There is the floating pack of ice of McMurdo Sound to the east and a few hundred yards to the west is the Wilson Piedmont Glacier. Beneath our feet was weathered rock and glacial deposits. Our first "tower" was built from scraps of wood salvaged from packing crates and we attained the magnificent height of 14 feet off the ground. However, this structure went over in the first 30-knot gust that came along. The beam was



20-meter beam at KC4USC, Marble Point, Antarctica.

bent a little in the fall, and although its symmetrical beauty was marred, its transmission properties were undamaged. The next support consisted of odds and ends of iron pipe and aluminum tubing inserted in an old packing crate and guyed with stray pieces of rope and twine. The beam was twenty feet high! It was not a thing of beauty, but withstood winds up to 40 knots, and while it swung crazily like a weather vane, it stood erect, or nearly so. We tried a folded dipole on 15 meters and another on 10 meters, but the results were not as gratifying.

Most of our reception was on s.s.b. while all of the transmission was on a.m. The G-66B afforded an excellent s.s.b. reception, although we had to keep retuning during a contact. This was not because of the receiver, but to the vagrancies of the generator. On battery operation, it would hold a station, but we did not have enough batteries for this type of supply.

Many are responsible for the success of our station operation, too many to thank by name. Jerry Kelliher, W1DTA, prepared the power supply and tested the gear before it left the States: Mike Ercolino, W2BDS, of Telrex built and donated the 20 meter beam; Don Ball, the engineer, who finally convinced us we were looking in the wrong direction (but who could imagine that Boston was southeast of Antarctica!); and the many Sea Bees who did everything but hold the beam in the air with their bare hands that we might keep going. Stateside, we are grateful to the many hams from the east coast to the west coast who listened to our a.m. signal whining on their s.s.b. sets. Many labored to catch us when they might have been listening to a nice crisp signal belted out from a 1-kw. rig.

(Continued on page 204)



#### CONDUCTED BY ELEANOR WILSON.\* WIOON

#### ONE HAM'S NIGHT BEFORE **CHRISTMAS**

(With apologies to Clement C. Moore)

'Twas the night before Christmas when all through the house

Not a creature was stirring, not even a mouse. The rig was tuned up with the greatest of care In hopes that the station I sought would be there. My hubby was nestled all snug in his bed But visions of rare DX danced through my head. When out of the speaker there came such a splatter I sprang to the dial to see what was the matter.

Away to the Collins I flew like a flash And threw in the filter to cut down the hash. With both gains turned back as far as they'd go, I waited to see if his call I would know. When what to my wondering ear should appear But "MC2U, Mobile", solid and clear. What a jolly old signal! I zeroed him quick, But I felt in my heart that it must be a trick.

In the many long years I had been in the game I had ne'er worked a station with such an odd name. I had contacted Danzig and Paris - Bombay And some little village in Paraguay. The QSL cards fairly covered the wall, But MC2U would be rarest of all. At last he stopped calling, 'twas time to let fly. If I messed this one up, I was sure I would die. With quivering lips and shaking knees too, I reached out my hand and the plate switch I threw.

And then, in a twinkling, I heard overhead A racket, enough to awaken the dead, My plate current jumped and the meters swung round, And down the chimney St. Nicholas came with a bound. He was dressed all in fur from his head to his foot And his clothes were all covered with tarnish and soot. A stump of a pipe he held tight in his teeth And something encircled his head like a wreath.



It circled his chest and his little round belly Like a meat-ball surrounded by vermicelli.

It seemed rather strange, this peculiar attire. Oh no! Could it be? My antenna wire!!! He held up a feeder, the jolly old elf, And we laughed till we cried, old St. Nick and myself. Then, laying a finger aside of his nose And giving a nod, up the chimney he rose. As I watched from the window, he went straight to work, And, in no time at all, he turned with a jerk. And there on the roof, standing sturdy and tall Was a beautiful beam, with rotator and all!

As my eyes filled with tears that longed to be shed, He peeked in the window and waggled his head. "Don't thank me, my sweet, it's the least I can do 'Cause you see, dear YL, I'm an amateur too!' Then he sprang to his sleigh, to his team gave a whistle, And away they all flew like the down of a thistle. And then, from the speaker, his voice, loud and clear, "Do you know what my call letters stand for, my dear?" His voice became dim as he faded from sight. "M for Merry -- C, Christmas, and 2 U a good-night!"

-VE3AJR



WHOOT members at the Dallas Women's Open Professional Golf Tournament: standing by at one of the tournament scoreboards are K5MTF, W5sBDB, SYL, KEC, and K5GMI. A high light of the activity for the YLs was the meeting of a number of national champion golfers.





Left: For fifteen-year-old KN1GUS, Phylli Zlotnick, and her twenty-year-old brother Sigh, W1NQL, ham radio is a means of traveling around while seated in their wheel chairs, for both have muscular dystrophy. Phyllis operates novice frequencies daily from her Portland, Connecticut, QTH. Right: At the National Convention in Washington last August, W1HAQ unexpectedly found herself operating K4NAA/3, the convention station, with a room full of old-timers kibitzing about her. Sixteen-year-old Marsha McCoy took it all in stride—maybe partly because she's the daughter of W1ICP of ARRL headquarters. Home at Granby, Conn., Marsha QSOs primarily on 10 meters.

#### A NEW COMBINATION

Ham radio "linked" to golf? Pardon the pun, but the Women Ham Operators of Texas provided the tie-in when they volunteered communications services for the annual Dallas Women's Open Professional Golf Tournament September 5–9th. Eleven WHOOT members, set-up at three locations on the Dallas Glen Lakes Country Club fairways, used two-meter Communicators to relay to golfers and spectators a hole-to-hole report on the score of competitors as they rounded the 18-hole course. Communications were organized by Eddie Aymond, W5UHV, a member of the Civitan Club of Dallas, sponsor of the

tournament, which is played for the benefit of mentally retarded and deaf children in the area. OM W5UHV and YLs K5s GBX, GMI, IPE, KDY, MTF; W5s BDB, KEC, SPV, SYL, YKE; and KN5PSK were commended for their services in what proved to be a very successful communications project.

#### YL CLUB FD SCORES

Our thanks to W1YYM, Ellen, of headquarters for supplying the following tabulation of YL Club 1958 Field Day logs and scores (class A — field station). See page 46 in this issue for complete schedule of FD results and the

	YL	RL NETS AND ROUND TA	ABLES
Phone			2200
Freq. Kc	Day	Time	NCS
3890	Monday	3:00 p.m. PST	W7HHH, alt. W7NJS
3970	"	10:00 a.m. CST	WøUDU, alts. WøBFW-WøPIK
3885	46	2:00 p.m. PST	W6KER, Southland YL Net
7225	66	9:00 a.m. EST	Floridora YLs (4th dist.)
7235	66	10:00 a.m. MST	WøTYB, Loaded Clothes Line
3838	Tues.	9:00 a.m. EST	WøKJZ, Pi-Net
3900	44	8:30 a.m. EST	K4CZP, Blue Ridge Net
29,000	64	1:00 p.m. EST	Hair Pin Net (No NCS*)
28,900	(1st Tues.)	9:00 p.m. EST	QRMary Round Table (each month
3900	Wed.	8:30 a.m. EST	W1TRE, Yankee Lassies
3900	66	9:30 a.m. EST	W8ATB, Welcome Net
3915	66	9:00 a.m. PST	W6GQZ, Ironing Board Net
7280	66	2:00 p.m. CST	Acara Yls, Kansas (10th dist)
146.1 Me.	**	7:00 P.M. PST	W6LBO, 2 meter YL Net
3880	Thurs.	8:00 a.m. CST	Texas YL Round Up Net
3985	64	9:00 a.m. EST	Georgia Peaches (4th dist.)
7235	44	10:00 a.m. CST	Texas YL Round Up Net
7215	66	9:00 a.m. EST	W3UUG, Friendly Forty
14,240	66	2:00 p.m. EST	Tangle Net (No NCS*)
7250	Friday	10:00 a.m. PST	W6QGX, YL Round Table
21,390	6.6	2:30 p.m. EST	KZ5VR, Cross Country

Please address inquiries regarding the above schedule of nets and round tables, which have been registered with the YLRL for the 1958-59 term, directly to YLRL Vice President Kay Anderson, W4BLR, 5210 Raleigh Road, Richmond, Virginia.

September YL column for general summary of YL par-

ticipation in the June 1958 FD.

Information as listed: call used, name of group, YL who submitted data, nr. of QSOs, power input (A under 30 watts, B 30 to 150 watts), nr. of participants, final score. K5BJU/5 Gulf Area YL ARKlub (Gaylarks), Harriett, K5BJU, 559-B-10-3504

W6BDE/6 San Francisco YLRC, Esther, W6BDE, 211-

AB-7-1572

K5QHI/5 Women Ham Operators of Texas (WHOOT), Bea, K5BNH, 215-B-9-1440

K5LZW/5 Women Ham Operators of Tarrant County, Inc. (WHO), Betty, W5ETH, 194-B-7-1320.

#### DXCC ADDITIONS

W1WPO of headquarters reports that since August the following YLs have been issued DXCC certificates: W3SKQ, W5EGD, KH6AUJ, KL7BHE (c.w. and phone) and W3GEN (phone only). KØACC should have been included in our annual listing of DXCC YLs, which appeared in the May 1958 column. Lola's certificate #1119 was dated 2/5/58, with all contacts on phone.

#### KEEPING UP WITH THE GIRLS

CLUBS:

N. Y. C. YLRL - welcomes all YLs in the N. Y. C. area to join with them for monthly meetings. Contact Lillian Byrne, K2JYZ, for details. At the September meeting Madeline, W2EEO, and Ruth, W2OWL, showed pictures taken at the last ARRL National Convention.

Los Angeles YLRC — At the first Fall meeting Martha,

W6QYL, and her OM W6RDQ, showed slides and talked about their three-year stay in Beirut, Lebanon, where

Martha operated as OD5CH.

Washington Area YLRC—met at the National Museum in September and elected the following officers: Pres. W3CDQ; V.P. W3RXJ; Secy. W3UTR; and Treas. W3UXU. K4LMB was appointed delegate to the Washington Foundation of Radio Clubs.

#### MISCELLANY:

OM W1HHR reports that the latest winner of the Willimantic Jaycees Worked All Connecticut award is W1YPH. Leona is the second YL winner in Massachusetts and the first YL to win the award using c.w. The W-Conn award is issued by the Willimantic Jr. Chamber of Commerce and is available to amateurs for contact with Connecticut's eight counties. Awards are presented at a formal meeting of the Jr. Chamber of Commerce chapter nearest to the applicant's city. . . . Mary, W6QPG, will operate from Wake Island in the YLRL A.P. and the YL-OM contest using her OM's call, KW6CQ, on 10, 15, 20 c.w. and 10 phone. . . . OM K8GHG reports that in addition to SP5YL, SP3SQ is an active Polish YL (on 15 meters). Bob has worked YU1OE, Mica, of Yugoslavia, several times



Little Miss Kris Abney, KN4ZTX, of Falls Church, Virginia, operates 7169 kc., using a Globe Chief and an S53A. Kris' uncle, W6KNM, who submitted her photo, became W2BZB in 1929 at the age of twelve. Kris is all of eleven at the moment.

A junior at Hollywood High School, 15-yearold KN6RFV, Margo Glasser, has her own DX 40 and HQ110. Dad KN6RFU has his own rig too, but apart from hamming they both share musical interests. KN6RFU has scored the music for hundreds of motion pictures, television and radio shows.



on 15 c.w. . . . Vada, W6CEE, Jean, K6OQD, and Pat, K6PFY, operated ham gear at the Los Angeles County Fair. . . Meta, WV6BNS, keeps track of her seven grandchildren by daily skeds with her daughter Mary, W6MWU. . . Dot, W4UF/W4ZKD, of Englewood and Gainesville, Florida, presented a paper on her research (blood parasites) at the Sixth International Congress of Tropical Medicine and Malaria in Lisbon, Portugal, in September. . . . For Ruth, W4BWR, and her OM installing mobile gear in their new 1958 Mercury was no labor at all - winning the car in a raffle made the work much easier....OM W3YLL reported this tidbit—both Muriel, W1KDY, and Louise, W3WRE, have the last name of Moreau, but are not related. Muriel lives on Russell Street in Winooski, Vt. Louise lives on Russell Avenue in Johnstown, Pa. . . . During her stay at a Birmingham hospital K4TWN used a six-meter Communicator for many hours of pleasant QSOs, including skeds with her OM, who operated mobile. Ethel's doctors and nurses warned visitors that her illness was harmless but that the ham radio bug might be contagious.

# Strays "

Rules for the 4th WAE DX Contest have just been received from DL7AA, DX Manager of DARC. They are much the same as usual except that the phone portion has been dropped due to the small number of such entries in the first three holdings of the contest. Details on the c.w. section, coming up from 2100 GMT January 9 through 2100 GMT January 11, will appear in "How's DX?" next month. A self-addressed envelope sent to the DARC DX Bureau, Fuchsienweg 51, Berlin-Rudow, Germany, together with one IRC (airmail five IRCs) will bring score and summary sheets.

A whole raft of equipment was stolen during October from Bil Harrison's Jamaica store, Items

and serial numbers are as follows: 32V-1 (283). 32V-3 (661), 32V-3 (297), HT-33 (158280), Viking II (5770), Pacemaker (16181), S-53A (56729), S-94 (172579), S-102 (95628), NC-300 (1926). Also taken was a quantity of hi-fi gear. A reward is being offered — contact Harrison Radio, 225 Greenwich St., New York 7. Telephone BArclay 7-7777.

ZS3JW says he has five hams in his family, and wonders if that is any sort of record.

If it's results you are after, call on QST — the stolen Communicator mentioned on page 10 in November has already been recovered. (The local hams did some excellent detective work.)

#### CONDUCTED BY ROD NEWKIRK,\* W9BRD

#### Whoa:

The searing sun sank low behind him, alkali haze settled like a shroud over the thirsty plains and Pecos Pete turned his imported cayuse toward the home corral where Sagging V wranglers gathered after a hard day's punchin'. Pete had a date tonight with Nepal Sal, a cute little number just in from the East, so he spurred on his nag at a gallop.

Git along, git along, Git along little dogie . . .

After a splash of cool water and a pan of hot grub Pecos saddled up and headed for the Old 20 bar. He inspected his gun's loading near the door and swaggered in toward the low end where Nepal Sal already was singing sweet songs to the boys. Elbowing through the mob, he gave Sal a quick call and glared meanly around him. 'Pokes scattered to either side, a couple of dudes from New York almost swallowed their eigars, and a hush fell over the house. The admirres around Nepal Sal melted away. All except one—rough and tough young Howlin' Sam of the Double Diamond range. Sam hitched up his belt, whistled at Nepal Sal and returned the snarls of Pecos Pete. But Sal played hard to git.

It's all yore misfortune
And none o' my own . . .

Pecos Pete spat viciously, tossed off one more and then really lit out after Nepal Sal. But Howlin' Sam blocked his way. Old Sol behind the bar pleaded, "Now we don't want no trouble, boys," and hit the floor. Bystanders scrambled under tables or hightailed it out of range. The air was electric in the Old 20 now. Many a grizzled OT went plumb loco and bit off his pipe on the spot. Nepal Sal commenced another tantalizing tune with Pete and Sam all ripe to draw.

Mah patience is shot And mah nerves are a-janglin' . . .

Sal cut off her song with a chirpy scream as Pecos Pete and Howlin' Sam grabbed for steel. Two blasts rang out together in the deepening dusk. Somebody laughed. Then somebody sobbed — the lights went out for Pecos Pete. Fickle Sal sashayed away to listen for Howlin' Sam's phone. Poor Pete crawled out of the shack and went downstairs to change fuses, bitterly knowing he was no longer top smoke in the West.

#### What:

And tomorrow the junkbox will be yore new home.... Well, Pecos Pete can always reach for more copper and try a comeback. Say, lots of DXcitement in the slots over the past few weeks. In the following band-samplings frequencies (in number of kilocycles above the lower band-limit) appear within parentheses. E.g., (9) = 14,009 kc. if the paragraph

\*4822 West Berteau Avenue, Chicago 41, Ill.

treats 20-meter work. Times are GMT using the nearest whole-hour figure such as 7 for 0720, 0 for 2349. Thus in the ten-meter phone paragraph "HZ1AB (652) 15" indicates that HZ1AB has been observed using 28,652 kc, around 1500 GMT. Let's commence the conspectus.

side-band stylists.

Oc.w. rolls out its red ionospheric carpet for all and sundry. "The band has been hotter than a ZD2 at noon," according to WIMEL. Agreement is registered by K2S AYC MHY, W3GYP, K3AMH/4 (80/57), W5KLB, K6QHC, W7QNI, W8S BMX CSK NOH, K8HTI, K9S ELT (67), GDQ ISP JIN and VE3BUR because of CE1AD (82) 17, CR6CK (22) 16, CX2BT, DM2ACN, DU7SV 100), ET2VB (20) 20, FA8AN, GB2SM just England, HA5DD (38) 17, ITIZDA (63) 18, K66AJ, KG4AZ, KP6AN, KZ5S DE IF, LAS 1WF 2KD 9OD, LX2GH, OESKI (75) 16, SPS 6FZ 7HX (110), SVØS WP (40) 20, WR (42) 14, TF3SF, UAS 1BE 2KAW (80), 4IF 6KOB, UB5UW, UF6FB (82) 16, UQ2BA (150) 15-16, VK9DB, V7BT, VO5EK, VU2RM 0, XES 1AX 1YF ØNHD, ZC4IK, ZD2JM (60) 2, ZES 1JV 7JY (44) 15, 4X4s IK IO and IV.

15 phone is flippin', too. Reporters W1MEL, K1CCA (103/65), K2s IXP (129), MHY, W4ZSH, K4OAQ, W5KLB, W6s KG OJW ZZ\*, W7VCB, W8s NOH Y1N\*, K9s GSG JIN, KØLEQ and VE3EIL give the word on CE3RC, CN8s AA EH EU, CPs 1AM 5EC, CX1BY, EL2N 2, F87RT\* GC2AAO, HC1RY, H12MC, HK4AQ 3, HL9KS, HP1s LB VA, HR2RH 2-3, IT1CDS 3, YL KA2HA, KC4s USK\* USV\*, KG4s AU AZ\*, KX6BQ\*, KZ5s AG KD, MP4BCC 12, OE1DH 20, PJ2s CE MC\*,



SVØWT, TF2WDD (403) 23, TGs 7AB 22, 9RY 9US, TI2s galore, UF6FB, UQ2AN (216) 12, UR2AO, VE1ADE of P.E.I., VE8s HV MO SO TE, VPs 1EE 3, 2DJ 5AR 0, 5ER 6JC 6ZX 7BX 19, 9BN 9DM, VUZCT (205) 18, XEIs in number, XW8AH (15) 17, YSIs JM (409) 12, MM, ZBIs DC US USA, ZSs 5DW\* 6AQQ\* 15 and various 4X4s.

ZBIs DC US USA, ZSs 5DW\* 6AQQ\* 15 and various 4X4s.

15 c.w.'s full DX potential is being realized by W1s EQ KGH MEL (31/3), K1s CBR CCA, W2s ETU HMJ, K2s AYC IXP MHY UPD, W3LAX, W4s USM YOK, K4s IGD OAQ OTG PHY, W5KLB, K5KGF, W6s KG OJW ZZ, K6s QHC THZ, W7s DJU QNI VCB, W8s CSK NOH, K8HTI, W9s FNX (85/71), LNQ (125/115), K9s ELT GDQ GSG ISP JIN, K9s HGB JPL LEQ LFY, 11ER and VE3EIL who account for CE1AD, CN2s AQ BK (40), CN8s CC DJ FM GH MK, CR6s AI CK (50), CT1ID, CXs 2BT (60), 5CO (62), DM2AEB, EA6AM, EL1K, GD3FXN, HAS 5AM 5DH 5KBR 8WS, HC8GI (35), HP1SB, HV1CN, IS1s CXF MM, IT1s AA AGA ZDA, (77), JAs 3IS 3TT 3UI 60K 7AD, JT1YL, K6IGP/KP6 (37), KA2KS, KB6BJ, KM6BL, KR6JF, far-south LUS (20), ZZS (100), LZ1AH, OES in concert, OA4s AGI FT, OY1R, PJ2s AL CJ ME (40), a dozen SPs, SL7BC just Sweden, ST2AR, SVØs WR WY, TF3S KG SF, TG7AB, T12s LA WR, UAS 1AU 1AS 2KAW 3BF 3CC 3HI 3KBR 6FQ 6KTB 6UF 9CM 9KQA 9OI 6CN, UB5S CK FG 10 KCE KIA UW, UC2s AX BB CB KAB KAR, UF6FB, UN1AE, U05AA, U02s AB AR AS BU, UR2KAE, VEBTO, VKØTC. VPS 7BT 7NA 8CR 9BO, curious VPØAB (40), 1CZ 6EE 9AS 9AT (60), XEØNHD (45) 21, XW8AH (20), 1GZ (45), ZES 1JN 11V 3JO, ZL5AC (40) of New Zealand's Antarctic, 4X4s CJ CK JT JU and 9G1CR.

Antaretic, 4X4s CJ CK JT JU and 9GICK.

15 Novice doings supply stuff like CE1AD, DU7SV, B1ER, JA4HM, KM6BJ, OK3KOT, PY4OD, SP9JA, TI2LA, VKs 3TF 3VJ 6EJ, WG6AHS, WH6s CNK COK, ZLs 1MT and 2AOV to the eager logs of KN1IMP, KN2HIY, KN3BUZ, KN6s EBL (one more continent to go for WAC), EBX and WV6BVR. The latter also managed KP4AOO on 40-meter code.

continent to go for WAC), EBX and WV6BVR. The latter also managed KP4AOO on 40-meter code.

20 c.w., harassed by mountainous QRM as the result of phenomenally short skip, performed willingly-for W1s KGH (150/126), MEL, K1s CBR CCA, W2s HMJ JBL, K2s AYC MHY UPD UYG, W3s GYP LOS (75/53), W4s FFF USM (113/80), ZSH, K4s LEX IGD OAQ PHY RPD, K5KGF, W6s FZH JQB KG ZZ (195), K6s CQF (121/67), ICS QHC SHJ, W7s DJU QNI VCB, W8s BMX CSK NOH YGR (125), K8ERU, W9FNX, K9s ELT JIN, K6s HGB JPL LFY (112/63), CE3AG, IIER, VE3EGG (40) and VS1FJ. Delectables detectable include AC4AX (100) 12-14, AP2C (50) 3, BV1US, CES 9AK (62) 5, 9AC (100) 20, CN2BK (37) 0, CN8s BF FV GD LC, CRs 6BX 6CK 7BC (60), CT2s AI BO, DMs 2ADB 2AQH 2AVN 3KCK 3KIB 3KKJ, DU7SV, EAS 6AM 8BK 8CP (40) 7, EL1X, ET2KY, FA8AN, FB8ZZ, FF8s AC/GN of the new state of Guinea, CC, FK8AS (10) 12, FP8AP, FQ8s AJ (44) 6, AP (85) 5, HA, FU8AE (80) 10, FY7YE (60), GCs 2FZC 3AAE 3HFE, GD3FBS, HAs in number, HCs, HL 4IM, HKs 4JC (8) 3, 5CR 5SG (73), HL9KR (30), HPIVA, HR8 2FG ØAA (14), HV1CN (50) 21 as guest-operated, ISIZUI (44) 1, IT1s AE AGA AQ ZDA (45), JT1AA, IZØDA (20) 11, scads of JAs in all call areas, K2ILQ/KG6, K6IGP/KP6 (42), K6IZJ/KG6, KA2S KS RS, K86BJ, KC4USV, KGs ICJ (37) 1, 1DL (38) 2, 4AP, KM6s BK (15) 8-11, BL (48), KR6s EO QW RP, KSs 4AY 4AZ 6AG (75) 11, KV4s AA (80) 22-2, BO (20), KW6CU, KX6s BT (40), CJ CW (72), LZs 1DX 1KPC

2KDO 2KLR (81) 0, 2KSH, LUs 1ZE 1ZS 2ZS of the Argentine's antarctic proximity, MP4DAA, strange MT4TG (31) 2-3, OD5LX (25) 4, ON4s BQ and CK in Luxembourg, OQ5s EH PE (64) 22, Belgian antarctic-outposter OR4s OR VN (98) 3, OX3UD, OY7ML (52) 19, PY7AN/Ø on Fernando de Noronha, PZIs AG AM (45), AO AR, RAEM of Moscow, SL5s AX DE of the Swedish military. SVØWR, TI2s PZ WD WR, YL UA3RU, UA1KAE/3 of Russia's antarctic endeavor, UA2s KAR KAW, UA9s CM DN KCA KCC (58), KKC, UA9s FF FS IJ JB KAD KAR KDA KIA KJV KKD KQB KUV KZA (85) 12, OM RK, UB5s en masse, UC2s AR BB CB (30), KAR, UD6s BG FA (70) 1, UF6s AF FB (4) 0, U18AK, UL7HB, UN1s AE (50) 5, KAB (1) 3, UO5PK (60) 5, UP2NM (28) 23, UO2s AB AJ AO AN AS BM KAV (53), UR2s AO (30) 4, AT (5) 20, BU (5) 22, VESS AB PB TO, VKS 9XK (35) 10, ØKT (40) 11-12, VPS 3AD (55) 2, 5AR 5BL 5LI 7M. 8BJ (31) 0-1, 8CR (10) 6, 8CY (85) 0, 9DM 9EP 9Y, VOS 2EW 2GW (38) 0, 3CF (85) 21, VR2s DA (86) 10, DG DK, VSS ICZ IFJ IGB 1HU IHX IJF 6AE (55), 6CO 6DS 9AC (49), 9AT (51) 23, VU2RA, WS 2EPS/KJ6 3ZJU/KP6 9HYM/KG6, XW8AI (38) 15, XZZTH, a dozen YOS, YV5GO, ZBS INB (43) 21, 2A 2I (40) 4, 2R, ZGS 3AC (85) 7, K2S AN AT (12) 3 and AU.

2O phone satisfied KICCA, W4USM, W6ZZ\*, K6ICS, POPOLO (10) and SIFJ (14) and SIFJ and SIFJ (15) and SIFJ (1

9G1CR, 9K2s AN AT (12) 3 and AU.

2O phone satisfied K1CCA, W4USM, W6ZZ\*, K6ICS, W8YIN\* K8CFU, VE1PQ\* (44 on s.s.b.) and V81FJ with the likes of BV1US, CN8MM\*, EL4A (310) 21, GD3GMH\* (308) 19, HC1AG\* (303) 1, HL9KR, HV1CN (283), HZ1AB\* (310) 0, KA2YA\* (302) 10, KC4USA\*, KG1s AJ\* (293), FD\*, KR6CP\* (315) 9, KX6BP\* KZ5CN\*, G306), MP4BBW\* (308) 2, OA4GB\*, OH9NC\* (305) 18, OK1MB\* (305), PJs 2AA\* 3AE (315) 4, TG9AD, VPs 1SD\* (310), 5ER\* (310) 23, VO\$ 4ERR\* 5FS\* (300) 19, VSs 2FJ (195) 14, 5AT 9MA\*, VUZRM\* (310), W3ZA/3W\* (324) 14, YS1MM (302) 1, YV5EC, ZLs 1ABZ (315) of the Kermadees, 3DA\* (314) of Chatham, ZS3E\* and 5A1TB\* (308) 19. The little stars blink for s.s.b.ers.

Alth (308) 19. The little stars blink for s.s.b.ers.

40 c.w. gains momentum after a slow start this season. K2GJS declares, "Never thought 40 much good for anything but rag-chewing, QRM and QRN. But things are happening!" And WIVKZ remarks, "Hearing quite a few DX stations calling CQ without W/K replies. More of our gang should avail themselves of 7-Mc. possibilities." Those thoughts are shared by K2AYC, W3LAX, W4FFF, K4RWH, K5LZD, K6QHC, W7s DJU VCB, K8EEG, K6HGB and KP4AOO who hit the 7-Mc. bull's-eye for DM2XLO, EL1K, FASEC, HC2ME, HP1TC, HRØAA, JAS 1BC 1BVS 2BP 2UW 3AMM/2 8IA, KA9PW, KC4USB, KX6BP, OE6KD, PJ2MF, PYS 6BQ ØCB of Fernando, SP9KAG (105) 3, UA9FS, UB5AZ, UC2KAB, VK9XK, VPS 2SH 5BL (3) 2, 7BT ØAB (again!), WH6s CKL COK, XE2BF, YO3FD, YUS 21J 2LP 3OS and break-of-dawn ZL/VKS......Forty phone's rag-chewers' monopoly was broken by KP4AOO in snagging H18BE and P12MC. Say, who's working DX on eighty?

PJ2MC. Say, who's working DX on eighty?

160 c.w. welcomes the 1958-'59 season's organized DX efforts as announced by W1BB, principal promulgator and protagonist: "The Transatlantic and World-Wide 160-Meter DX Tests will take place at 0500-0730 GMT on these Sunday mornings — December 7th and 21st, January 4th and 18th, February 8th and 15th, During those periods special efforts will be made to contact European, Asian, African and other 160-meter amateurs throughout the world. Working DX on 'top band' is challenging and extremely interesting. Interference by atmospherics, BC harmonics, loran, etc., calls for extreme patience, perseverance, a top-notch s ation and keen operating techniques.

Hams are where you find them, an ecological truism, and these landscapes are striking studies in DX environment. Left to right, this page and next: (1) A cleanly mounted cubical quad certainly does something for the Burgos villa of EA1GH. (2) That's ZD6JL's three-element beam and Blantyre back yard. (3) Polar bears get under foot at the Dickson Island diggings of UA6JKAR and this one seems to be on the trail of a discarded pizza pie. (4) Lastly, we chance upon LA2JE/P enjoying his morning Hope Island, Svalbard, constitutional accompanied by some of Jack London's old cronies. (Photos via Ws 61TH, 6NXP, 9WHM and 11CP)





An active group of British and other overseas amateurs, in cooperation with U. S. operators, are behind this effort, a yearly DX activity since 1932. All amateurs throughout the world of 160 are invited and urged to participate. There still are new 1.8-Mc. countries to work and 'firsts' to be made. Most W/K/VEs will operate in the 1800-1825-kc, segment while those in the West will use 1975-2000 kc. DX mainly will be found in the 1800-1875-kc, region, particularly 1800-1835 kc,, but don't neglect 2000-kc. DX possibilities." W1BB recommends that W/K/VE stations call CQ DX TEST during the first five minutes of each hour, listen during the second 5-minute period, call for five more minutes, etc., until the DX ball starts rolling. Send reports of results and observations to W1BB and/or Jeeves & Co, — good luck and fine fishin'!

#### Where:

Asia — Concerning HZ1AB verifications we hear from W3IDU: "Anyone who did not receive a deserved HZ1AB card for the period February through April, 1958, can obtain one by forwarding a QSL or note with contact details. All cards so far received have been answered but, due to mail restrictions, malfunctions and other reasons, I feel that many cards destined for me were not received. All applicants will be answered promptly and 100 per cent." More on the same subject from K2SGO: "As of tents. November I am handling all QSLs for HZ1AB. Those desiring direct replies must submit stamped self-addressed envelones. applicants will be answered promptly and 100 per cent." More on the same subject from K28GO: "As of this November I am handling all QSLs for HZ1AB. Those desiring direct replies must submit stamped self-addressed envelopes. Others will go via bureaus in answer to cards as received. I receive logs from HZ1AB monthly." Bob's offer is good only to amateurs in the U.S., its possessions, and Canada. . . . . . . VS2DQ, a Malaya mainstay, will be holidaying in the U.K. till April of next year. James can be reached c/o Westminster Bank Ltd., Town Hall Sq., Bekhill-on-Sea, Sussex, England, in the interim. . . . . . Regarding JT1 confirmation assistance OK1JX confides to W8DAW: "I had to stop all this QSL business for quite a while because of my job. Please excuse the delay, you and the other boys." . . . . . . From Maldives' munificent VS9MA courtesy ex-487DT and W1WPO: "Our first pack of QSLs to the States eft around mid-August. At this date all cards to W/Ks have been cleared, those for bureaus by sea. At the moment we have no cards left, and the scarcity of QSL stock disinclines us to send repeats by air in return for cards sent to us direct with IRCs, etc." . . . . . . "OD5BZ is permanently off the air," reports the man himself, W8BKO. "Fortunately my departure from Lebanon took place under relatively peaceful conditions and I was able to ship my gear as well as all logs and a few excess QSLs. I believe I have forwarded a card to every station with whom I had complete two-way contact. However, if anyone has failed to receive a confirmation I will be glad to forward a duplicate from my home address." Now Bob aims to get W8BKO back in action on the shorter end of the DX stick . . . . . . . . The XW8AH address that follows is most applicable to the North American gang. W1EQ suggests that overseas DXers use: Sydney S. Wagoner, jr., c/o U. S. Embassy, Vientiane, Laos . . . . . . . "I invite all amateurs who Q8Od V81HQ and who have not so far received cards to write me at my G3LCS address (which follows)." Des states he h which is indicative of illegal operation. Rumors also have reached us of some persons possibly carrying portable equipment who may be operating despite prohibition. We are attempting to track down such rumor and stop such operation if it exists. Bootlegging'... can only jeopardize negotiations for permission to operate amateur radio in Turkey. We acknowledge these comments but must point out that TA calls can be signed by cranks anywhere in the world and QSLs for such nonsense naturally will wind up in Turkey. Viz., the fact that such QSLs arrive in Turkey is no valid proof that clandestine Turkish amateurs exist. Furthermore, it is accepted by almost every government Furthermore, it is accepted by almost every government in the world that an organization of responsible amateurs with privileges to guard is the best possible precaution

that can be taken against such illegalities. Self-policing is

are authorized to work only other amateurs as indicated by internationally agreed-upon ham-type prefix-plus-numeral call signs. Exceptions often are authorized, such as Armed Forces Day contacts with AIR, NSS and WAR. And there seems to be no enforced prohibition of QSOs with such established unorthodox calls as RAEM, UPOL7, etc.

Hereabouts — Watch your Ks and Ws when using the Call Book, gang. It's very easy to slip down a notch and extract an address for the right suffix but wrong prefix. K4RQR describes a crucial example: Today, as has happened at other times in the past, I received a QSL card and self-addressed envelope for forwarding to a Caribbean station. My name and address were correct on this mail but my call appeared as W4RQR." These communications of course pertain to W4RQR's 1958 s.s.b. DX travels down in the islands. Offhand we can divine no compelling reason 









UR2AR (left) and UA1FE are well-worked soviet DXers. The former frequently is encountered on 15-meter c.w. and phone running up to 200 watts. UAIFE is the son of UAIDG whose picture appears in your June 1958 column. Albert prefers (Photos via W9s WHM and UFV) 20 c.w. and a younger brother monitors DX proceedings as s.w.l. UA1-604.

for a deserving rare overseas op in real need..... The boys at KG1CJ guarantee that "QSLs will be sent to all stations worked as soon as stock arrives from the printer. stations worked as soon as stock arrives from the printer. We hope it will be soon because contacts are really piling up. KGls on 20 c.w. seem to strike the boys as reasonably rare."..... Despite much furious spurious evidence to the contrary, WØAGO assures WIs AZW BDI VG and others that there was no legitimate 14-Mc. operation by HC8AGO ..... W10HA reasonably holds that any amateur who has no intention of confirming Q8Os with Q8Ls ought to have the gumption to say so during contact, a forthright IRC-shipment caveat.... W1MEL finds it convenient to index recent "How's" QTHS in a little black book. Others prefer to use one Call Book each year for the purpose, annotating under the proper heading something like here we go. . .

CE1AGI, 146 Bueras, Apt. 6, Santiago, Chile CN2AK, T. Ramon, 2 Juana de Arco, Tangier, Tangier Zone CN2BL, P. E. Oxild, 117 Blvd. de Paris, Tangier, Tangier Zone

Zone
CO2US, G. Mestre, P. O. Box 63, Marianao, Cuba
CP1AX, C. Greene (K2DGD), Instituto Linguistico,
Casilla 64, Riberalta, Beni, Bolivia
FK8AT (via W2CTN)
FL8AC, G. Malosse, P. O. Box 121, Djibouti, Fr. Somaliland
FQ8AF, G. Crauet, P. O. Box 218, Brazzaville, Fr. Equatorial Africa
FURAF L. Chaumont, Port Vila, New Hebrides

torial Africa
FUSAE, L. Chaumont, Port Vila, New Hebrides
HA5KFR, P. O. Box 185, Budapest 4, Hungary
HH2ID, L. Decatrel, P. O. Box 596, Port-au-Prince, Haiti
H11BE (via H18RM)

HIBE (via HISRM)

HK4AO, G. Olarte, P. O. Box 2161, Medellin, Colombia

HL9KS, W. B. Carman (W1BJI), Hq. USA Advisory Gp.,

APO 102, San Francisco, Calif.

HRILH (to W3WTE)

HVICV (via ARI)

HZ1AB (see preceding text)

JZ6HA (via W2CTN)

K6IGP/KP6 (to K6IGP)

K0OOF/VO1 (to KØOOF)

K0RDL/VO1, H. D. Benson, Box 88, APO 864, New York,

N. Y.

KA2RS, T/Sgt. R. W. Stevens, 1954th AACS Sqdn., APO 994, San Francisco, Calif. ex-KA9AA-KR6AA-W4VE-W5MY, Col. F. B. Wester-

ex-KAYAA-KRGAA-W4VE-W5M1, Col. F. B. Westervelt, USMC, Croix Chapeau Medical Installation, APO 219, New York, N. Y. KA9PW (to W7UYO) KC6AO, U. S. Weather Bureau, Koror, Western Carolines KG1AH, Lt. Col. John Wolfe, APO 23, New York, N. Y. KG1CJ, L. E. Patience, 1983rd AACS Sodn., APO 23, New York, N. Y.

ex-KG1CK (to WØUBT)

KL7CUR (to W7WPR) KEZUK (to WYWPK)
KR6BF, American Consular Unit, Naha, Okinawa, or via
APO 235, San Francisco, Calif.
KW6CU, Box 112, Wake Island
KZ5CM, Box 615, Curundu, Canal Zone
KZ5RR (to W3WTE)
KZ5US, R. Orbach (WA2ABH), Box 399, Albrook AFB,
Canal Zone

KZ5US, R. Orbach (WA2ABH), Box 399, Albrook AFB, Canal Zone
MP4DAA, P. O. Box 330, Bahrein, Persian Gulf
MT4TG, Box 29, Mogadiscio, Somalia
OA4DE, M. R. Rusca S., P. O. Box 538, Lima, Peru
OA4GR (via OA4DE)
ex-OD5BZ (to W8BKO)
OE3RW/p (to OE1RW)
OE4FF/p (to OE1FF)
OOPB, Box 110, Astrida, Ruanda-Urundi, Belgian Congo
OR4OR (via UBA)
PY4OR, Rua Uba 475, Belo Horizonte, M.G., Brazil
SPITN (to SPIKHA)
SP3SQ, Barbara Jarzombek, Box 412, Poznan, Poland
SP3CP, M. Bartnik, Box 336, Lublin, Poland
TG9RB (to W3WTE)
UP2KBC, Box 224, Kaunas, Lithuanian S.S.R.
ex-VE3BQL/SU, E. C. Veale, VE3BQL, 439 East 42nd
St., Hamilton, Ontario, Canada
VK2AOO, A. O'Donnell (ex-ZC5AL), 207 Buccaneer Bay
Rd., Caringbah, N.S.W., Australia
VP2LS, L. Ellis, P. O. Box 171, Castries, St. Lucia, W. I.
VP2MX (via KV4AA)
VP9EF, 1604th FMS, APO 856, New York, N. Y.
VQ1ERR (to VQ4ERR)
VQ1PBD (to VQ3PBD)
VS1BB/ZC5 (to VS1BB)
VS1GB, 16 Woodsville Flats. Woodsville Rd., Singapore 13

VSIBB/ZC5 (to VSIBB)
VSIGB, 16 Woodsville Flats, Woodsville Rd., Singapore 13
ex-VSIHQ, D. Shepherd, G3LCS, 35 The Crescent, Haversham Estate, Wolverton, Bucks., England

Snam Estate, Wolverton, Bucks, England VU2AJ, B. Dutt, Overseas Communications, Service Jan-path, New Delhi, India W2EPS/KJ6 (to W2EPS) W3VEX/KM6, L. Moorhead, Box 19, Navy 3080, FPO, San Francisco, Calif.

San Francisco, Calif.
W3ZJU/KP6 (to W3ZJU)
W5EMB/V01, J. Whitten, 1933-1 AACS Det., Harmon AFB, Stephenville, Nfld., Canada
W8ZVL/KL7 (to W8ZVL)
W9PBW/ZK1 (to W\$PBW)
XE1JP, J. L. Alvarado, P. O. Box 60, Puebla, Puebla,

XE2MS, P. O. Box 182, Torreon, Coahuila, Mexico XW8AH, Syd Wagoner (W8UTQ), Box L, Navy 150,

FPO, San Francisco, Calif. (and see preceding text)

FFO, San Francisco, Calif. (and see preceding text)
XZ2TH (via W2CTN)
YNITF (to W3WTE)
YSIMM, M. Molina V., Box 517, San Salvador, El Salvador
YSITT (to W3WTE)
ZAIs AA KB, Box 42, Tirana, Albania
ZBIDG, A. Farrugia, 16 Castle Hill, Victoria, Gozo, Malta
ZBITC, A. Cefai, 102 St. George's St., Victoria, Gozo,
Malta

ZBIUSA, Navy 240, FPO, New York, N. Y.
ZC5GN (via G3JFC)
ZD2GWS, W. Slinger, c/o GPO, Yola, Nigeria
ZD2WCP, W. C. Pitman, c/o West Africa Airways, Ikeja
Airport, Lagos, Nigeria

ex-ZD9AE, B. Brokensha, ZS6AJY, 2 Constellation Bldg., Rhodesfield, Kempton Park, Transvaal, So. Africa

Rhodesneid, Nempton Fark, Fransvaal, So. Africa 3A2CF (to G3ZY) 4S7FM, RAF Ekala, c/o Katunayake, Ceylon ex-4S7MA, R. Andree, Com. EL(R) Officer, R. Cy. N. Royal Navy Barracks, Devonport, Devonshire, England

#### Whence:

efforts continue for procuring a change in law to permit such operation. Ham operation took place initially in Turkey after WW-II apparently with the tacit approval of authorities. However, such operation was stopped in early 1953 due, it is claimed, to the interception of transof authorities. However, such operation was stopped in early 1953 due, it is claimed, to the interception of transmissions in which amateur operators were outspoken and critical of personalities, attitudes, politics, methods, and so forth."———WSYIN perceives W3DHJ performing as W3ZA/3W's second op on 20 side band.....VS9AT's new DX-20 exhaler does well on 14,052-ke.c.w. according to W2HMJ.———Oriental items courtesy WGDXC, OVARA, WVDXC and International Short Wave League organs: FCC-ITU Ban Listes 3WSFM claims Hanoi as QTH and gives the Czech bureau as a QSL route...W3ZA/3W has been scheduling W2JXH daily between 1030 and 1130 GMT near 14,298 kc...GM3LQZ now enjoys much DX sport as V86EE while near-by club station VS6CT fattens its communal log with a homebrew 35-watter, AR-88, HRO, Vee beam, ground-plane and dipoles. QSO output by Das Islander MP4DAA has our 14-Mc. school agog.

Africa — Our kaleidoscopic DX scene reflects the new autonomy of French Guinea where FF8AC has been holding forth on 20 c.w.....VE3BQL/SU closed down his Rafah activity on the Gaza Strip and returned to Canada by way of Greece and Gibraltar where transcoffee QSOs with SVs and ZB2s ensued. "Ten opened to the U. S. A. a few weeks before QRT time so I had a real blitz giving out SU credits. Fifteen meters didn't open too often to W/K-land but we knocked off plenty of Asians, Pacifics and Far Easterners on that band. Nothing especially startling so far as 20 was concerned, just the usual traffic skeds with VEs." Elvin fought hard for WAS but Idaho, Nevada, N. Mex., Utah, Vt. and Wyo, held out. "Home in Hamilton I hope to be active on all bands as before, 75- and 80-meter net activities included.".....ET2TO left Eritrea last month but expects to return to Asmara in March or April. Tom will be busy in Morocco during January and Feb-

month but expects to return to Asmara in March or April. month but expects to return to Asmara in March or April, Tom will be busy in Morocco during January and February . . . . . ZS6ALH tells K6DDO of his hunger for Idaho, Me., Mont., Nev., the Dakotas, Utah and Vt. around 21,330 and 28,490 kc. . . . . . . FQ8AF frequents ham bands once again from Brazzaville after six months on the Continent. W1KRS finds him interested in receiving unneeded electronics literature, technical reviews and the like . . . . . W2JBL collided with W1YLY behind the 14-Mc. key of CN8GD . . . . . W8YIN hears that



# ULAN BATOR-MONGOLIAN PEOPLE'S REPUBLIC-ZONE 23

The world's rarest YL dispenses a fetching QSL.

ZS6AQQ may try a little more ZS9ing this month. Meanwhile he has interested ZS9s A and P in the possibilities of single side band. Mickey also notes that the XYL of 15-meter specialist ZS5DW now signs ZS5KQ.\_\_.\_\_KBERU learns that ET2KY resolutely maintains a black list of DX piggies whose uncouth tactics disqualify them from entry in his log.\_\_.\_Club African data via SCDXC, ISWL and WGDXC: VQ1s ERR (September) and PBD (October) were effectively actuated by VQs 4ERR and 3PBD. . . G3JKO now is said to be in the Sudan with operational inclinations. . . FB8BC expresses his opinion that FB8CD may well be back in the Comoros this month. this month.

his opinion that FB8CD may well be back in the Comoros this month.

Oceania — VS1FJ's voluminous DX notebook deserves another peek: Frank finds that VS1BB/ZC5 had a fall ball in North Borneo with W6UOU's s.s.b.-generating sputnik.

... VS5AT is intermittently radio-active on 14-Mc. voice when other activities permit.

CZ3AC keeps oozing Christmas spirit on 14,052, 14,082 or 14,109 kc. daily around noon GMT.\_\_\_\_K6IGP/KP6's month on Palmyra passed fast thanks to 300 watts and a phased array on 20 phone. OVARA tags him as an Air Force man .\_\_\_\_VK2AOO (ex-ZC5AL) tells W6KG that future United Nations assignments may take him to additional rarish locales .\_\_\_\_ W6ZZ observes ZL2GX maintaining order in 20-meter Kermadecs queues seeking consultations with ZL1ABZ. Mike hangs out around 14,315 kc, and his aversion to c.w. calls many a dusty rusty modulator into play .\_\_\_\_K8ERU was particularly delighted to work VR2DK. "Imagine being anybody's first Ohio QSO!"

.\_\_\_\_ Seekers after WAIL (worked all island locations) credentials may be interested in lines from W3VEX/KM6. "The Midways consist of two main islands, Sand and sparsely populated Eastern. The latter finds use as a remotereceiver communications post and heretofore has based no ham station." Larry hints that somepody soon will take sparsely populated Eastern. The acter must use as a remove-receiver communications post and heretofore has based no ham station." Larry hints that somebody soon will take care of that, however......KH6MG and WØPBW com-pleted solar eclipse observations and an astronomical quantity of 10- and 15-meter contacts from the Danger

VS1FJ's homespun 25-watter claims a QRO-type DX record: 210/175. The receiver is an Eddystone 888; antennas include a ground-plane for 14 Mc. and an 86-foot wire center fed with open line for 40, 15 and 10 meters. You may recall Frank's equally potent QRP DX work under previous VS9GT and MP4BAB colors. photo of VS1FJ's Somerset home station, G3IDC, appears in March 1954 QST DX pages.



Islands in October. We second W8YIN's motion for more eclipses and eclipse expeditions.\_\_.\_\_WVDXC and WGDXC dispatches from the Pacific: ZL3DA's first thousand Chatham QSOs included some 900 with W/K aficianados. . . VR3A sustained a fractured leg in a Fanning accident and recuperates in Sydney. . . VK2AIR of VK2AYY/LH fame still strives mightily for VR5 and/or ZM7 DXpeditionary authorization.

Europe — W2SHC relates interesting PX DXcursional plans of CN8IU: "If all goes according to plan Pitt will be operating 10, 15 and 20 meters, a.m. and probably s.s.b., from the 14th to 20th of this month. He is also applying for a 3A2 call." CN8IU is in process of transferring to Germany and will motor northward through Spain and France, wintry weather and all.\_\_\_\_\_W2HMJ has it that LAs 4DD and 6CF revise estimates of earliest Jan Mayen activity forward to 1960.\_\_\_\_Well-known W5MY, erstwhile ex-W4VE-KA9AA-KB6AA, now serves with the Marine Corps near La Rochelle, France, and awaits his F7 suffix. "This is my first tour in Europe," writes Fred, "and probably the last tour for me anywhere before retirement. I have my Navigator and 75A-3 all set up and I'm impatient to get on the air from this excellent location. Signals roll in from all over the world and there is very little man-made noise. I certainly look forward to firing up and renewing acquaintances with the gang on 7-, 14-and 21-Mc. c.w.!".\_\_\_\_\_Increasing visual difficulties hamper IIER in carrying out his ionospheric propagation studies and experiments in Milan, Not many IIs can match Mario's towering total of W/K/VE contacts and sterling QSL performance.\_\_\_\_\_DLGR, G3GIY, IIs DFC FA MF OS TCI, OESKI, YU28 HK IP LJ and ex-W7AII were among the DX contingent attending Padova's recent ARI convention, IIDFC will be recalled as former HLIAA.\_\_\_\_\_\_Continent and noise out the world and there is merchant mariner G3JPQ has visited 48 countries, thus surpassing his home station's countries-worked tally.

South America — CE3AG, assiduously cooking up Juan Fernandez furor tentatively scheduled for next month, redefines the Chilean prefix pattern as follows: CE1-CE8, contnental Chile; CE9AA-CE9AM, Grahamland, Antarctica; CE9AT-CE9AS, Deception Island, South Shetlands; CE9AT-CE9AZ, Greenwich Island, South Shetlands; CE9A, Easter Island; and CE9Z, Juan Fernandez. The latter consists of three islands of some 70 square miles total area, these discovered by a Portuguese pilot serving Spain 'way back in 1574. This gentleman, one Joao Fernandes, had true DX spirit and was granted the islands by the Spanish crown. He stocked the place well with pigs and goats but must have run out of QSLs and 807s, for he soon abandoned residence. Not much more was heard from Juan Fernandez until a century later when a haphazard and WGF) put Operation Turtle and the Galapagos on 15- and 20-meter phone beginning October 9th from Cristobal Island. W\$\textit{A}GO, however, found it necessary to return to Minnesota from Quito before he had an opportunity to put HC8AGO on the air. W6ZZ and friends QSOd HC8WGF/mm aboard schooner Don Tito as the salts neared destination.....Grahamlander VP8DN hopes to manage WAS with a cc. 14-watter lurking on 14,030 kc. almost daily between 2300 and 0245 GMT.

Hereabouts — W2HMJ understands that HR\$\textit{\textit{R}}AA\$ is a gent bent on finding a quite stoot to settle down; hence his

gent bent on finding a quiet spot to settle down; hence his



When DX men think of the Azores they usually think in terms of CT2BO. This isn't surprising because Gil has logged over 13,000 QSOs on DX bands since 1936. He runs about 40 watts and does fine with that S-40A receiver. (Photo via W7PHO)

14-island Honduras tour. How about the Aldabras, man? .....VESTO runs 500 watts to a 375-ft.-per-leg Vee beam up north, receiving with a cool 51J-4. "This layout is a far cry from the 35-watter I nursed along at GM3HLD!" ....." KGICJ is operated by W4HGQ, K2HUE and myself, KøKTS. I prefer c.w. around 14,050-14,060 kc. but Luke and John vote for s.s.b. near 14,275. Our gear includes an HT-32, SX-101 and 3-element 20-meter rotary. A 500-watt linear amplifier project is under way." ..... S.w.l. Patrick Wright observes interesting activity by VEØMC aboard CGS Stonetown in the Pacific. A DX-40 sender and home-styled receiver suffice ..... W8KX's DX buddy ex-W8ESR now signs WA6AMZ out West—and it isn't easy ..... San Diego DX Club hosted DX Breakfast doings at the ARRL Southwestern Division Convention in October. W6AM and cohorts enjoyed a meeting with Hq.'s W1LVQ, F08AT Clipperton color slides courtesy W6ZVQ and friends, and W6LRU's tricky DX questionnaire. KR6LJ and W6AM tied for top honors in the brain strain ...... "CO2DD now is a student at MLIT," informs W1NTK. "He expects to be a New Englander for the next five years." ...... W3WTE, accompanying Dr. Milton Eisenhower's Central America factinding tour, ran off 314 multiprefixed DX gSOs with a KWM-1 in late July. Bob signed HR1LH, KZ5RR, TG9RB, T12USA, YN1TF and YS1TT along the route ...... KZ5US (WA2ABH) enthuses, "Ten really has been hot here this fall! It seems that most of the KZ5 boys don't care too much for 'this DX stuff' so I'm creating quite a series of pile-ups." ...... K6CQF plumps for greater respect for the KN sign. In the final analysis it's all up to the DX stations who use it. If violations are perquite a series of pile-ups."...... K6CQF plumps for greater respect for the KN sign. In the final analysis it's all up to the DX stations who use it. If violations are permitted to pay off, more violations there will be ...... W8YIN has VP2VB's pending Yasme II itinerary as Dominica, Guadeloupe, St. Vincent, Anguilla and Grenada; Daniel's Pacific Ocean e.t.a. is April ...... WGDXC DX detectives detect rumblings of impending Cocos Island (TIQ) developments (TI9) developments.

Ten Years Ago in "How's DX?" — Superfluous testing gets a lambasting in the December 1948 column's preliminary commentary ... ... W6CIS reports working ZS2G for a neat 3.5-Mc, West Coast WAC, Forty is slow, though .... Twenty c.w. offers AP4A, C7LT, one CZ2AC purportedly in Monaco, EPs 1J 2B, curious HDPP of the Galapagos, HL1s AB BA AE, Js 6LPP 7ABN 9ACS 9ANZ, KAs 1USA 6FA, M1B, MD2BU, M13AB, PJØX, T1KY, VU4AC, W8 3MPM/C7 4DGW/KJ6 6ZNT/KW6 9MCF/CI, YR5I, YU7AX, ZC6XY, ZD9AA and ZP3AW .... Phonewise on 14 Mc, Cs 1CH 3EA 7AC, HB1ED, HL1s AA BG BK, J7ACS, KA1AF, VR3A, W6RET/KG6 and ZC6UN are on hand .... AP2F, J2AZA, MB9AD, MD3AB, W8 6YOT/C6 and 71LE/KX6 top the ten-phone crop. On 28-Mc. c. w. W2WMV/C9 continues to draw heavy code fire .... Scattered chatter: W2AIS departs for Palestine with great 3.5-Mc. determination. . . . J2AHI apparently spearheads Yanks-in-Japan DXers with 140 worked. ... ARIWW returns to W2VLG and a mountain of QSLs. . . . . VP2GJ of Windwards DXpeditionary sensation turns out to be none other than ex-ARRL staff man VE3QV . . . . . Pix of G16TK, VU2FS and HC2KJ appear — and there is evidence that our fearless factotum, J. J. Jeeves, is beginning to enjoy ramifications of TVI. Ten Years Ago in "How's DX?" - Superfluous testing

#### CONDUCTED BY EDWARD P. TILTON,\* WIHDQ

Most of our leading 2-meter operators around the country have worked distances in excess of 1000 miles at one time or another. Some of these long-haul contacts were made by capitalizing on meteor showers or auroral conditions, but a vast majority of all the 144-Mc. DX on record is tropospheric in nature. This predominance of weather-induced DX is even more marked if we include all the work done over greater than normal distances.

Yet how many 2-meter men have worked all the states within a 1000-mile radius? Relatively few have turned the trick, and most of these have done it only recently. Why the lag? The answer is found in the geographical distribution of activity.

V.h.f. interest developed first in areas of high population density. It took many years to convince amateurs in other sections that operation on a v.h.f. band is worth the effort, but now we have well-equipped stations and alert operators in almost every corner of the country. As a result, 2-meter men less often find their range under favorable conditions limited by an "activity barrier."

For years we have dreamed of working the length of the Atlantic Seaboard on 144 Mc. Someday a Maine-to-Florida contact will be made on 2 meters, and the only real stumbling block in the way is the lack of well-equipped stations all along the line, with their owners knowing when to try. The same can almost certainly be said for a Seattle-to-San Diego QSO. Neither of these events has yet come off, but the Atlantic Seaboard was all but spanned during the tropospheric propagation of early October.

This was no ordinary coastal inversion. The opening first manifested itself far inland during the evening of Oct. 7. Hurricane Janice was churning her way up from the Caribbean, the far western fringes of her skirts hurling Gulf of Mexico weather up over New England, bringing that delightful condition known variously as "Indian Summer" and "World Series Weather." Tropospheric propagation was good on all the v.h.f. bands, around the clock, for days and nights on end. It is often that way during the hurricane season

Around 2030 EST on Oct. 7, W4EQM, Langdale, Ala., began to hear weak phone signals from the northeast. At 2050, Carey identified W1JDF, Methuen, Mass., raised him on a c.w. call, and the most extensive tropospheric opening on record for the eastern seaboard was under way. W4EQM was busy until 0130 the following morn-

ing, working W1AZK, Chichester, N. H., W2BLV, Haddonfield, N. J., W2ESX, Moorestown, N. J., W1JSM, Waltham, Mass., W2AZL,



•				
2 3 4	WØZJB WØBJV WØCJS W5AJG	14 WØHVW 15 WØWKB 16 WØSMJ 17 WØOGW	26 WØMVG 27 WØCNM 28 WIVNH 29 WØOLY	39 WØDDX 40 WØDO 41 K9DXT 42 W6ABN
	W9ZHL	18 W7ERA	30 W7HEA	43 W6BAZ
	W9OCA	19 W3OJU	31 KØGQG	44 VE3AET
	W6OB	20 W6TMI	32 W7FFE	45 W9JFP
8	WØINI	21 K6EDX	33 WØPFP	46 WØQIN
9	WIHDQ	22 W5SFW	34 W6BJI	47 WØWWN
10	W5MJD	23 WØORE	35 W2MEU	48 K9ETD
11	W2IDZ	24 W9ALU	36 W1CLS	49 WØFKY
12	W7LLL	25 W8CMS	37 W6PUZ	50 W8LPD
13	WØDZM		38 W7ILL	51 WØZTW

12 W7LLL 13 WØDZM		25 W8CM	S	37 W6PUZ 38 W7ILL					
W1FOS	47	W4EQR	46	W7YJE	46	WØIBL	46		
W1AEP	47	W4LNG	45	W7ACD	46	WøJOL	46		
W1CGY	46	W4RFR	45	W7JPA	46	WøJHS	46		
W1LSN	46	W4AKX	44	W7CAM	45	WØOFZ	46		
W1SUZ	46	W4MS	44	W7BOC	45	Wøyzv	46		
W1RFU	45	K4DNG	44	W7MAH	42	WøQVZ	45		
W1ELP	44	W4HHK	43	W7MKW	40	KØAKJ	45		
W1KHL	44	K4GYZ	43	W7JRG	40	WØWNU	45		
W1IKO	44	W4FNR	42	W7UFB	39	KØDXS	44		
W1CLH	44	W4ZBQ	42	TTTOOLOGE	4.00	KøGKR	43		
W1LGE	43	K4AGM	40	W8SSD	47	WØBTG	43		
W1FZ	43	K4KYL	40	W8HXT	47	WøPKD	43		
W1TAM	42	********	40	W8WPD	47	KØCLJ	41		
Woball	APT	W5VY	48	W8HJR	47	TEHON			
W2RGV	47	W5LFQ	47	W8RFW	47	VE7CN	45		
W2BYM	47	W5ONS W5VV	46	W8NOH W8SQU	47	VE1EF	42		
K2ITP	47	W5VV W5EXZ	45	W8SQU W8OJN	46	VE7AQQ	40		
W2FHJ K2CBA	46	W5FSC	45 45	K8CIC	46	VE3AIB VE2AOM	39		
K2UDA K2ITQ	46 46	W5BXA	45	K8ACC	46 46	KL7AUV	38 36		
W2SHV		W5KTD	40	W8NQD	45	EI2W	35		
K2AXQ	45 43	W5FXN	44	W8UZ	45	VE3BHQ	33		
W2EIF	43	W5ML	44	W8ESZ	44	VE3DER	33		
K2VIX	42	K5ABW	42	WSINQ	43	VE3DER VE1PQ	32		
K2LTW	42	W5HEZ	42	WSEVH	42	VE3OJ	32		
W2ORA	40	W5JME	42	11 017 111	44	VE4HS	31		
WZUIM	40	W5CVW	42	W9BRN	48	XEIGE	30		
W3TIF	47	W5VVW	42	W9ZHB	48	SM7ZN	29		
W3KKN	45	1101111	14	W9QUV	48	PZ1AE	28		
W3KMV	45	W6UXN	48	W9RQM	47	VEIWL	28		
W3RUE	44	W6WNN	48	W9MHP	47	CO2ZX	27		
W3MXW	44	W6IWS	48	W9AAG	46	ZE2JV	26		
W3BGI	44	W6ANN	47	W9DSP	46	LU9MA	26		
W3OTC	42	W6GCG	47	W9EPT	$\frac{10}{46}$	ZS3G	26		
W3FPH	42	K6JCA	47	W9JCI	45	SM6ANR	24		
W3NKM	$\tilde{42}$	K6HYY	47	W9UIA	45	SM6BTT	23		
W3ZYK	42	W6NLZ	46	K9EID	45	VE1ZR	23		
W3LFC	41	W6JKN	46	W9SWH	44	CO6WW	21		
		K6KXR	46	K9GFQ	43	LA9T	20		
K4DJ0	47	K6RNQ	45	W9KLŘ	43	LA7Y	18		
W4UMF	47	W6AJF	45	W9IMG	42	VQ2PL	18		
W4AZC	47	W6CAN	44			KH6UK	17		
W4UCH	47	W6NIT	43	WØAEH	47	JA1AUH	16		
W4EQM	47	W6BWG	40	WØFKY	47	JA8BU	14		
W4IKK	46	K6ERG	40	WØNFM	47	ZE2JV	12		
W4ZZ	46	K6UJL	40	KØDTA	47	JA1AAT	12		
W4CPZ	46			KøJJA	47				
WADDH	46	W7DVD	47	Wadce	47				

<sup>\*</sup> V.H.F. Editor, QST.



Certificates are a dime a dozen these days, but here is one that has real significance. Offered by the Raritan Bay Radio Amateurs of South Amboy, N. J., it sets up a 1000-mile club for 144-Mc. men who have done two-way work over distances in excess of 1000 miles. Proof of such contact should be submitted to W2TTM, Secretary.

Plainfield, N. J., K1CRQ, Bethlehem, Conn., W3TDF, Langhorne, Pa., W2BV, Minotola, N. J., W2AMJ, Bergenfield, N. J., W1AJR, Middletown, R. I., W4FJ, Richmond, Va., K2QJY, Farmingdale, N. J., K2IEJ, Oceanside, N. Y., W1RJA, Milford, Conn., K4EUS, Chester, Va., W1RFU, Wilbraham, Mass., W1REZ, Fairfield, Conn., and W1KCS, Providence, R. I. Most of these meant a new state for the stations involved, and all were tropospheric firsts.

Several of the fellows listed above reported hearing QRM on W4EQM, eventually finding this to be caused by W4FWH, Doraville, Ga. He and W4LNG, Atlanta, got in plenty of contacts, though we do not have complete lists for them at this writing. W4LNG was alerted by telephone by W2BLV. Ruddy had his final stage dismantled, but got on with his 5894 exciter and did right well.

The following evening the center of action swung slightly to the east, and the long-awaited opening to Florida developed. W4RMU, Oceanway, Fla., near Jacksonville, was the hero of this occasion. Allen had been keeping nightly schedules beaming north at 2100 for some time, and this paid off on the 8th. Having access to weather information, he was not too greatly surprised when W4LTU, Falls Church, Va., called him on c.w. after his 10-minute schedule transmission. While this QSO was going on, W4RMU's telephone rang, and W2BLV reported that he was S3 in Haddonfield, N. J.

W4LTU swung his beam around to the northeast to spread the word and another DX session was rolling. Allen was going strong until 0200 EST on the 9th, working, in this order, W2CXY, Chatham, N. J., W2PAU, Westmont, N. J., W4DBV, Rome, Ga., W3PYW, Silver Spring, Md., W2BV, W3TUZ, Wheaton, Md., W2AZL, W2AMJ, W1REZ, K4TNB, Arlington, Va., K2QJY, K2GQI, Keyport, N. J., W4UMF, Falls Church, Va., W3TDF, and W3UJG, Rockville, Md.

W4RMU sent us upper air soundings taken over Charleston, S. C., at 1900 EST on the 8th and 0700 on the 9th. Janice was centered out in the Atlantic, east of Myrtle Beach, S. C., during this period, and an elongated high-pressure area extended down the Atlantic Seaboard. The 0700 temperature curve for Charleston shows an 18-degree inversion at 4000 feet, with temperatures higher than the surface reading all the way up to 15,000 feet. Dewpoint readings show very marked layers of dry air between 3000 and 6000 feet and 14,000 to 15,000 feet.

Allen reports that conditions did not seem to be entirely reciprocal. At no time did he hear more than 3 or 4 stations, and the band was dead for periods of ten minutes or more, yet stations all the way from Georgia to New England were hearing and calling him. W4TKE, Gainesville, Fla., came on at 2345 EST, but managed to work only W2AMJ. W4MBR was on in Vero Beach and heard W4RMU working W1REZ, but neither he nor W4TKE heard any W1s. The W1s, on the other hand, heard W4RMU as far north as W1AZK, Chichester, N. H., who reported Allen S3 at 2237 EST.

To answer the many "Where were you?" queries we received, W1HDQ was on 220 Mcboth nights. There we still have an activity barrier. Signals from the southwest were simply tremendous — what there were of them. W3UJG, Rockville, Md., was S9-plus for hours on the night of the 7th, and we managed a QSO with W4UBY, Annandale, Va., who was running only a 6360 and an indoor beam. He was the end of the line. Who knows what might have been done, had some 220-Mc. stations been active in the Carolinas or farther south, with a reasonable

#### RECORDS

Two-Way Work 50 Mc.: LU3EX — JA6FR 12,000 Miles - March 24, 1956 144 Mc.: W6NLZ — KH6UK 2540 Miles — July 8, 1957 220 Mc.: W9EQC — W2DWJ 740 Miles — September 17, 1957 420 Mc.: G3HAZ - DL3YBA 500 Miles — June 19, 1957 1215 Mc.: W6MMU/6 - K6AXN/6 270 Miles — Sept. 21, 1958 2300 Mc.: W6IFE/6 - W6ET/6 150 Miles — October 5, 1947 \*3300 Mc.: W6IFE/6 -- W6VIX/6 190 Miles — June 9, 1956 5650 Mc.: W6VIX/6 — K6MBL 34 Miles — October 12, 1957 10,000 Mc.: W6VIX /6 - W6BGK /6 124 Miles — June 23, 1957 \*\*21,000 Mc.: W1NVL/2 -- W9SAD/2 800 Feet - May 18, 1946

\*Band now 3500-3700 Mc. \*\*Band now 22,000 to 23,000 Mc.

90 QST for

amount of power and big antennas? The events on 144 Mc. these evenings give some clue.

#### 50-Mc. DX News

If there ever was any doubt that Cycle 19 (sunspot number records date back to 1750) is the hottest ever, it should be dispelled by our 50-Mc. experience this fall. In the previous cycle there was only one year (1947) in which an appreciable number of 50-Mc. contacts could be made across the Atlantic. We have already had two record fall seasons, 1957–8 having offered 50-Mc. DX almost daily from late October to February. How will it go this year?

The transatlantic  $F_2$  DX season began Oct. 14, at least a week ahead of schedule, with reception of European TV signals up to about 50.6 Mc. in midmorning. The first crossband contacts with British 10-meter stations were made two days later, and the band was open between the East and West Coasts the same day. The first transcontinental contact we have record of was made by K6SRC, San Bruno, Call and W4COP, Hollywood Fla at 0731 PST, Oct. 16.

Cal., and W4CQP, Hollywood, Fla., at 0731 PST, Oct. 16.

The automatic c.w. of CT1CO, Lisbon, Portugal, was first heard by the writer and W1SUZ on Oct. 18. Manuel came through progressively earlier the next two days, his signal appearing out of the background noise at 0700 EST on the 20th. It should be a relief to 6-meter men on the West Coast to know that CT1CO may now be found on 50.008 Mc., instead of his former 50.1, probably the worst possible spot for weak-signal DX work. Thus far we have heard him only on automatic. Though the keying sequence has been changed he still sends "CQ de CT1CO." Long dashes are interspersed, to show that this is in the nature of a test transmission.

EI2W, near Dublin, Ireland, worked his first 50-Mc. DX of the fall season Oct. 19. Harry was on voice, using the same frequency as last year, 50.016 Mc., though he may move up higher in the first 100 kc. soon.

KL7AUV, Anchorage, Alaska, heard his first signs of 50-Mc. DX Oct. 15. At noon on the 17th JAs started coming through, weakly and with deep fading. Jack and wife Margie, KL7BLL, worked three of them, the opening lasting about an hour. Signals were better on the 18th, and 13 contacts were made with 10 different JAs, between noon and 1408 Anchorage time. The Alaska 6-meter fraternity has lost KL7AZI, KL7MS and KL7CDG, all of whom are now in the States, but Jack hopes that more recruits will come in to fill the gap left by these stalwarts. Anchorage stations are working above 50.1 Mc. this year, to keep down local QRM at the low edge.

A path never before covered on 50 Mc. was worked on Oct. 8, when CT3AE, Madeira Islands, worked JA3CE and KA2AS around 2400 GMT. Signals were of moderate strength, with much fading. José reports that his beam peaked southwest for best signal strength. Was this longway-around transequatorial scatter? CT3AE found the band open to Japan again on the 11th, working JA3CE and

JA2AEQ. Transequatorial scatter to Argentina and Brazil was very good, the band being open for this mode 7 out of the first 12 days of October.

One ham who hit the *TE* season right on the nose, without knowing what he was getting into, is KZ5CN, Howard Air Force Base, Canal Zone. At the urging of friends in Caracas, Skip got on 6 Sept. 30. He finished hooking up his 6-meter converter at 2030 on that date, and two minutes later he heard LU1ABF calling CQ 6. Contact was made, and at once KZ5CN found himself swamped with calls from Argentina. Up to Oct. 10, KZ5CN had heard only LU and CE, but he and KZ5LP will be watching the band in other directions.

An interesting prospect for 50-Mc. DX is VU2CQ, Bombay, India. Mickey was on 6 during the previous solar cycle, and is an old hand at all kinds of DX work. W1YPK and others tell us that he is on 28.25 Mc. looking for v.h.f. men in the States who can work on 10.

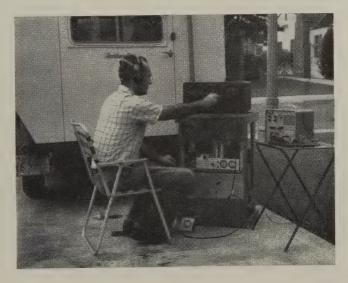
Transequatorial work, some of it apparently not of the TE scatter variety, is reported by W5LFM, San Antonio, Texas. Cal worked LU3EX, LU4DFN, XE1PFE and XE1NL Sept. 20, the latter two presumably by sporadic E. CESAE, CVJ, OA3AAF and many LUs were heard, in an evening session lasting from 1850 to 2235 CST. On Sept. 28 the IGY stations were heard at 0840 CST, by normal F2-layer propagation. They stayed in all morning, with varying strengths, reaching the strongest on record around noon. CESAE remained audible until about 1615, but in all that time no 50-Mc amateur signals were heard.

We strongly suspect that most South American 50-Mc. operators are so surfeited with TE-type work in the evening hours that they do not monitor the band extensively in daylight. Early in the morning of Oct. 16 we heard many Spanish-speaking f.m. telephone signals near the low edge of the band, and the IGY stations were in for a short time around 0900 EST. Back-scatter signals from W2 and 3 could be heard at W1HDQ at this time, but not a sign of a South American amateur signal could be found.

Something new in 50-Mc. DX broke at midday Oct. 23, with the appearance of XE1GE in northeastern U.S.A. Not that Jeff is any newcomer on 6 anywhere in the country, but to have him boom in with an S9-plus F2-type signal is new. We've worked XE1GE by every weak-signal mode known to man, and for many years, but by all reports there was nothing weak about the signal he poured into W1 and 2 during the Oct. 23 noon hour. It's less than 2200 miles from Southern New England to Mexico City, so this is on the near edge for normal F2. Your conductor missed this one, so we will have to wait to check the reports in greater detail, before classifying it as to propagation mode, but it was different from anything heard from XE1GE in these parts heretofore.

We write this material with the feeling that all that has happened thus far (up to the last week of October) is but a prelude to one of the most interesting seasons 6-meter men have ever experienced, and that what we report here will

Don Goshay, W6MMU, tests out his 1296-Mc. station in preparation for an onslaught on the DX record. W6MMU/6 has broken the record twice, the most recent expedition being described herewith. Equipment is crystal-controlled for both transmitting and receiving, and c.w. only is used on 1296 Mc. Communicator is employed in liaison work. Details of the W6MMU 1296-Mc. converter will appear shortly in QST.



read like ancient history by the time it appears in print. One thing seems certain, however: even if we are over the peak of this solar cycle, its declining phase should spring plenty of surprises.

Best guesses now are that paths in the northern hemisphere will show m.u.f. about the same as last year, but that there will be more disturbances. Aurora should be more frequent, and more violent. North-south openings, usually associated with disturbed periods, should be more frequent than during the rising phase of this cycle. African countries may come through, even if the m.u.f. on east-west paths above the equator falls below last year. Watch the frequencies just below the band for commercial signals, and be sure you check in all directions. Don't give up on 6 just because the Europen TV signals stop coming through!

the next night. There was just a slight trace of fuzz on some 6-meter signals when your conductor checked at 2230 EST, and it disappeared soon after, so we quit. A look at 0630 on the 24th showed some faint buzz on near-local signals, but no DX. At 0715 things picked up, instead of fading out, and W1, 2, 3, 8 and 9 signals came through for more than an hour thereafter. We heard our last aurora signals at 0830, which is the latest we can recall hearing an aurora hang on into the morning.

Activity on 220 Mc. in the Los Angeles area has reached the point where net operation is being started. K6GKX writes that the Inter-County Net convenes on 221.5 Mc. each Monday, Wednesday and Friday at 2000 PST. The first session had 15 participants and it is expected to at

#### Here and There on the V.H.F. Bands

The annual Midwinter V.H.F. Conference will be held Dec. 6 at Western Michigan University, Kalamazoo, according to word from W8NOH. Chairman will be W8CVQ. Reservations may be made through him or W8JUU.

A preamplifier for 50 Mc. can be had the easy way by using a TV booster tuned to Channel 2. Jim Robinson, call not known, uses a Mallory MTB-13X to hop up reception on his S-106.

Some of the contact totals now being run up on 6 are all but unbelievable to those of us who lived though the sparse activity of the early '50s. As an example, K50QN, Houston, Texas, has 457 QSLs for contacts made between March 15 and Oct. 1 of this year. Most of these were made with a Communicator, while his 250-watt rig sits idly by.

The SCM for South Texas, who passed along the above info, also tells us that W5TKP is working out with a transistor rig on 6, putting some 16 milliwatts into the antenna.

Having gotten up to 42 states on 6, W7MAH, Reno, Nev., is putting a big signal on 144 Mc. as well. John has a 4X250B, a long Yagi and a 417A converter ready for DX schedules. He will continue on 6 during the  $F_2$  season, too, in hope of catching Delaware, South Carolina, Kentucky, Wisconsin, West Virginia and North Dakota. Nevada going begging on 6? Times have changed!

From Down Under, VK3ZDG passes along the details of the Australian limited license. It involves a technical examination of somewhat stiffer nature than our General Class. Privileges are the same as for the regular ticket, except that operation is confined to the frequencies above 50 Mc., and the holder may not use c.w. Maybe that would be a good idea here — make it a privilege to use the code! Holders are identified by three-letter Z calls. Aussies may soon lose 50 Mc. to television, though they are trying hard to retain it for the present, at least.

Tropospheric scatter schedules are still being maintained by WølC and W5VWU, as reported last month. Signals are heard regularly both ways over this mountainous path, but generally the copy is poor. Not enough experience has been accumulated over circuits of this kind to know what to expect, and opinions differ considerably. On a path where tropospheric bending is likely to occur there almost certainly would be stronger signals in the warm months. Over rough and irregular mountain terrain there is likely to be almost constant turbulence, with conditions favorable to scattering, but not to bending, with the result that conditions should vary little around the year.

Here's some unusual mobile DX on 144 Mc. WøZJB, returning from the National Convention, caught a tropospheric opening while driving across Ohio and Indiana. W4HJQ, Glendale, Ky., was raised when WøZJB/8 was 20 miles east of Columbus, Ohio, a distance of about 240 miles. Contact was maintained to Richmond, Ind., W8SQU, Cleveland, was picked up about 50 miles west of Columbus, and held into Indianapolis, about 250 miles. All this was without the usual mobile flutter. The W3MSR/9 mobile work with W9TQ and WØYPT, reported last month, was on 144 Mc., not 50 as stated in November OST.

This sunspot cycle being what it is, we should not place too much dependence on past experience in looking for DX on the v.h.f. bands. Auroras, for example, may be showing up at all hours, rather than just the late afternoon or early evening. Take the period beginning Oct. 22, for example. There was a fairly good aurora the night of the 22nd, early in the evening, but fellows who hung on for a late-evening recurrence waited in vain. There was a milder aurora early

#### 2-METER STANDINGS

Figures are states, U.S. call areas, and mileage to most distant station worked.

W1REZ29 W1AZK24 W1KCS23 W1RFU23 W1AJR22 W1HDO20	8 7 7 7 7 6	1175 1205 1150 1120 1130 1020	W5CVW 11 W5NDE 11 W5VY 10 W5ONS 9 W5FEK 8	55332	$\begin{array}{c} 1180 \\ 625 \\ 1200 \\ 950 \\ 560 \end{array}$
WIREZ. 29 WIAZK. 24 WIKCS. 23 WIRFU. 23 WIAJR. 22 WIHDQ. 20 WIMMN. 20 WILZY. 19 WILZY. 17 WICLH. 17 KIABR. 16 WIPHR. 16 WIBHN. 16 WIKHL. 16	6 6 6 6 5 6	900 875 920 860 450 810 780	W6NLZ. 12 W6WSQ. 10 W6DNG 9 W6AJF 6 W6ZL. 5 W6MMU. 3	455332	2540 1390 1040 800 1400 950
W1BCN16 W1KHL16 W2CXY37 W2ORI36	5 8 8	1360 1250 1390	W7VMP11 W7JRG8 W7LHL4 W7JIP4	5 4 2 2 2	1280 1040 1050 900 353
W2CNY 37 W2ORI 36 W2NLY 36 K2GQI 30 W2AZL 29 W2BLV 27 K2HEJ 25 W2AMJ 25 W2DWJ 23 K2HOD 23 W2SMX 22 W2PAU 21 K2CEH 21 W2LWI 21	88888766676686676756	1390 1200 1050 1020 1060 960 860 950 940 724 910 700 700 880 720 1040 850 980	W8KAY 38 W8WXV 35 W8LOF 33 W8PT 32 W8SVI 30 W8SFG 30 W8LPD 29 W8LPD 29 W8EHW 28 W8WRN 28 W8WRN 28 W8BAX 27 W8DX 26 W8IUC 25 W8JWV 25 W8GFN 23 W8DF 21 W8DX 24 W8DX 25 W8JWV 25 W	888888888888888777	1020
W3GKP. 29 W3KCA. 28 W3TDF. 28 W3SGA. 26 W3FPH. 22 W3NKM. 20 W3LNA. 20	8 8 8 8 7 8 7 7	975 1020 1110 915 700 1000 730 720 650	W9KLR 40 W9W0K 40 W9GAB 33 W9REM 31 W9AAG 30 W9ZIH 30 W9LVC 27 W9EQC 26	9 9	1160 1150 1075 850 1050 830 950 820 700
W4HJQ. 38 W4HHK 35 W4ZXI 34 W4AO. 30 W4MKJ 28 W4UMF 28 W4VLA 26 W4EQM 25 W4WNH 24 W4JCJ. 23 K4EUS 22	89888888666	1150 1280 950 1120 850 1110 1000 1040 850 725 765 720 720	WSGTK. 18  W9KLR. 40  W9WOK. 40  W9GAB. 33  W9REM. 31  W9AAG. 30  W9LIH. 30  W9LVC. 27  W9EQC. 26  W9ZHL. 25  W9BPV. 25  K9AQP. 24  W9PBP. 23  W9LF. 22  W9PMN. 29  W9KPS. 22  W9FMN. 19  W9ALU. 18  W9JIY. 17  W9LEE. 16  W9DDG. 16  W9DDG. 16	88888877877678666	700 1030 900 820 825 690 800 790 780 700 720
W3LZD. 20 W4HJQ. 38 W4HHK 35 W4ZXI 34 W4AO. 30 W4MKJ 28 W4UMF 28 W4UMF 28 W4UVLA 26 W4EQM 25 W4WNL 24 W4JCJ 23 K4EUS 22 W4VVE 21 W4IKZ 20 W4OLK 20 W4OLK 20 W4OLK 18 W4CPZ 18 W4TLV 18	6 6 6 6 7 6 7 7 6 8 5 5 6 4 2	720 720 720 840 650 1000 820 650 830 720 800 920 860 335	WØSMJ 29 KØEMQ 29 KØIHD 27 WØIHD 27 WØGUD 25 WØRUF 23 WØINI 21 WØUOP 21 WØTGC 21 WØTGC 21 WØTGC 17 WØZJB 18 WØRYG 17 WØJIFS 16 WØJIFS 13 WØIU 12	9 7 7 8 7 7 6 6 6 6 5 6	1075 1110 890 1060 1065 900 830 900 875 1180 925 1100 700 1240
W5RCI. 33 W5DFU 25 W5AJG 22 W5KTD 22 W5KTD 22 W5JWL 21 W5LPG 19 W5VKH 15 W5PZ. 14 W5FSC 12 W5HEZ 12	9 9 8 8 7 6 5 5 6 5 5 5	1215 1300 1280 1200 1150 1000 720 700 1255 1390 1250	VE3DIR. 28 VE3AIB. 26 VE3AIB. 26 VE3BQN. 19 VE3AQG. 17 VE3DER. 16 VE2AOK. 13 VE3BPB. 14 VE7FJ. 2 KH6UK. 1	8 8 7 7 5 6 1 2	1100 910 790 800 820 550 715 365

least double this when it gets rolling. Traffic and emergency operation are emphasized.

#### The World Above 1000 Mc.

Here are more details of the 270-mile record set during the September V.H.F. Party week end by W6MMU/6 and K6AXN/6. Don, W6MMU, set up on 8831-foot Mt. Pinos. Mike, K6AXN, with the help of W6VSV, was in business on Mt. Diablo, a 3849-foot elevation east of Oakland. Contact attempts were started around noon Sept. 20, and continued, without success, until 2300, when the boys decided to call it a day.

A 2-meter liaison circuit had been provided, but this failed when W6MMU's 2-meter linear amplifier developed a short, blowing the rectifiers and power transformer in the high-voltage supply. The Communicator alone was not of sufficient power to maintain consistent communication direct, but part-time liaison was available through W6BUT at Taft.

W6MMU/6 started up at 0730 the next morning, not knowing if K6AXN/6 was in operation or not. Don heard Mike's 1296-Mc. signal first at 0802, but two-way communication was not established for another 15 minutes. Signals were weak most of the time, fading into the noise on occasion, so the entire operation was carried out on c.w. After the first hour or so of work tests were continued with automatic keying, until about 1015, when signals disappeared for good.

The contact began on vertical polarization. In the course of arranging to change to horizontal they inadvertently worked for some time with cross polarization, without realizing it. When this was discovered, signals had faded deeply, but satisfactory communication was restored when both stations were horizontal. This proves nothing about polarization, except that it was shifting — and that polarization diversity systems might well give considerably improved results over long u.h.f. paths such as this.

There were also some direction peculiarities observed over this obstructed circuit of 270 miles. One way the 144-Mc. signal was best on a direct line between the two paths, while the 1296-Mc. signal peaked 10 degrees to the east. In the opposite direction these conditions were reversed as to band! This anomaly was checked out on both vertical and horizontal polarization.

More activity by members of the San Bernardino Microwave Society is reported by W6OYJ. On Sept. 28 W6SDE/6, Corona, Cal., worked K6MBL at Pomona on 3500 Mc. This is some 16 miles, with the Chico hills intervening. The Corona site was a small knoll, but the path to Pomona is not line of sight. W6OYJ/6, set up at the same site, also worked K6MBL. The two stations then moved to the home of W6SDE, and set up on the roof. At that point, some 200 feet lower than the first spot, no signal could be heard from K6MBL, though contact was maintained on a 144-Mc. liaison circuit. W6SDE then swung his 21-inch parabola around toward W6VIX in Ontario, whereupon two-way communication was established over the 14-mile distance.

This is a line-of-sight circuit, but it is a 3500-Mc. "first" in that it was two-way work between home stations. Equipment used was the polaplexer system described in June *QST* by W6BGK. Parabolas used by W6VIX and W6SDE were 21 inches in diameter. W6OYJ used a 29-inch dish and K6MBL a 40-inch one.

#### Putting the DX-35 on 50 Mc.

Seems everyone wants 6-meter conversions for commercial transmitters these days. Such conversions are not worked out at ARRL Headquarters, and unless someone does the job and sends us his step-by-step procedure we cannot supply conversion information. We've run 6-meter conversions for the Viking I (Dec. 1952), the AT-1 (May, 1957), the Adventurer (Sept. 1958), and the DX-40 (Aug. 1958, page 146). A Ranger conversion article is in the works.

Here is a simple step-by-step routine for putting the DX-35 on 6, sent in by K2VIN. Changes are made by cutting out the 10-meter band, but replacement of it at a later date should not be difficult. The 10-meter coil has 4 turns; cut it down to 2. Make a new grid coil for the 6146, using 9 turns ½-inch diameter, same length as the original. Bypass the low end of the 6146 grid resistor. Tune the oscillator plate circuit to twice the frequency of the crystal, which should be in the 8.4-Mc. range.

The second 12BY7 triples to 50 Mc., driving the 6146

straight through. Tuning is similar to that on lower bands, but the operator should be sure that he has the right harmonic at each tuned circuit.

#### V.H.F. Sweepstakes - Jan. 10-11

The major contest event of the v.h.f. man's year is the V.H.F. Sweepstakes. Normally held the first week end in January, it was moved to the second this year to space it out a bit from the holiday week end. One change in the rules is made for the 1959 contest. A major inequity that came to light for the first time last year has been removed. Contacts can be made between different time zones only when the contest is under way for both zones. If we get an  $F_2$  opening Saturday afternoon the East Coast will not be able to clean up at the expense of the West. Details elsewhere in this issue. Reserve that second week end in 1959 right now!

#### OES Notes

W1EUJ, Tyngsboro, Mass.—A 50-kw. station is about to go on the air on 49.6 Mc. in Waltham, Mass. What will this do to the 50-Mc. band in the area?

W1EXZ, Danville, Vt. — Working into Maine daily on 50 Me., presumably due to obstacle gain over the White Mountains. Worked K1CXX, Auburn, Me., nightly while he was rebuilding his regular home rig and was using only 7½ watts. W1QIG, Standish, Me., also worked over the Presidential Range when he was using 8 watts. These are 100-mile paths.

W1LGE, Windsor Locks, Conn. — First 50-Mc. opening across Atlantic Oct. 14, more than a week ahead of previous record. European video signals up to about 50.6 Mc. that day.

W2LWI, Wappingers Falls, N. Y.—Hearing video signals from East (Africa?) on 50.4, 50.8 and 51.8 Mc.

W3GKP, Spencerville, Md. — Earth potential measurements continue. Highest thus far recorded ranged from minus 3.9 to plus 4.0 volts, July 8.

K4KYL, Knoxville, Tenn. — Stations now active within reliable range number close to 200. Activity in prospect on 220 Mc. also.

W60YM, Sherman Oaks, Cal. — Continuing mountain peak reflection and refraction experiments reported last month. It has been found that maximum refraction signal over a ridge or peak occurs when the two stations are approximately the same distance either side of the mountain. Installation of a half-wave rod at the top of the obstruction makes it possible to vary the distance of the communicating stations from the mountain considerably without appreciable loss of signal strength, so long as both are in line of sight to the reradiating antenna.

W6PBC, Belmont, Cal. — Oscillator-amplifier with resonant cavities tuning 400 to 1300 Mc. built and in use. K6AXN, W6VSV and K6ONM all working regularly on 1296 Mc.

K9GAJ, Fond du lac, Wis. — Put s.s.b. on 50 Mc. with 6360 mixer and 10B. Managed to work East Coast stations during sporadic-E opening with this very low output.

# Please Write Your Postal Zone Number

• By including your correct zone number each time you write your address you can speed delivery of your own mail and help cut Post Office costs. The Post Office must do extra work to deliver each letter, parcel and magazine that does not show the correct postal zone number in the address. It will help you — it will help the Post Office — and it will help us. Thanks.



# Correspondence From Members-

The publishers of QST assume no responsibility for statements made herein by correspondents.

C.W.

327 Grant Street Cadiz, Ohio

Editor, QST:

My OM and I are both Novices, and we are working for our Generals. In October QST there is a letter (from a Novice, of all things!) saying c.w. is a primitive and obsolete method of communication. We must disagree with that wholeheartedly! C.w. goes farther, the equipment is cheaper to build, and it is universally understood. There is also quite a feeling of satisfaction to mastering the skill of a "good fist".  $-Ann\ O.\ Warren,\ KN8LGA$ 

829 E. Mitchell Avenue Cincinnati 29, Ohio

Editor, QST:

I was once a Novice like KN6LXA, and like him, I hated being on code all the time and counted the days until I would get my General. I got it; and got on phone. I found out then that a phone signal takes much more bandwidth than c.w. signals. Where phone couldn't get through the QRM, c.w. could. After many hopeless months on phone I have returned to the lower portion of the bands and have a better time ragchewing with a Novice or another ham in Ohio on c.w. than trying to break the fone QRM.

— Charles H. Benet, K8DNH

868 E. 7th Street Brooklyn 30, New York

Editor, QST:

KN6LXA probably thinks that because he is having no end of trouble with the mastery of the code it is unnecessary for the amateur license exams. I, too, am having considerable trouble with the code but I recognize its importance, even though I wish I didn't have to know it. If code was an obsolescent mode of communication I am sure the FCC would have eliminated it from amateur exams a long time ago. If he is so dissatisfied with c.w. I suggest that he just give up operating on code on the Novice bands and go on 2 meters until his license expires and then he will be rid of c.w. once and for all. Then he will have nothing to complain about.

— Kim Boriskin, KN2MGS

7504 Mt. Carmel Road Pittsburgh 6, Pa.

Editor, QST:

You are to be commended for your equity in printing the snarling attack on c.w. by KN6LXA. One might wonder where a Novice gained the experience and knowledge to make the ridiculous statement that c.w. is obsolescent.

Obsolescent, indeed! Dollar-for-dollar and watt-for-watt, it is still the most efficient and accurate form of radio communications. . . . — Steven Moroso, K3AGF

9 Bennett Street Canisteo, N. Y.

Editor, QST:

. . . In my job I am talking all day and it is good to be able to communicate with others and yet keep my mouth shut. — Duane H. Harris, K2PFC

Athens Obio

Editor, QST:

I like c.w. but I wouldn't want to see you rascals thrown out just because you won't pull for strictly c.w. and no phone. Where would the hams be today without what the rascals at ARRL have done and are doing today for all hams?

— E. J. Greer, K8CKW

20 Orchard Road Maplewood, New Jersey

Editor, QST:

If ARRL had been pampering c.w., I am sure that ham-

dom would have risen long ago to throw you "rascals" out. It says on my 20 w.p.m. Code Proficiency certificate: ". . . in the basic art of the true amateur, reception by ear of the international morse or continental code . . ." I don't think truer words have ever been spoken. Thousands of amateurs are struggling to obtain such certificates. . . .

And better watch out whom you call rascals. If it weren't for the League, our hobby could not exist.

— Paul Gili, W20PB

#### **TECHNICIANS**

Phoenix, Arizona

Editor, QST:

I have run across quite a few General Class hams on the low bands who are constantly complaining about the Technician class of license and they seem to think the FCC should require a faster code test, a harder written examination, etc. You can usually find the majority of the Technicians on 6-meter phone, ragchewing and having a good time. It seems silly to require a 13 w.p.m. code test of these boys because I doubt seriously if many of them would use c.w. to any great extent. It seems so many of the General Class hams have absolutely no love for the Technician regardless of who he is. Yet, how many of these Generals have ever tuned 6 meters? I have found these 6-meter boys to be pretty decent fellows. These guys on six are enjoying themselves. Why don't we leave it that way? Let's live and let live.

— Rae A. Echols, Jr., W7FFF

6341-A Maple Street University City, Missouri

Editor, QST:

I'm not acquainted with v.h.f. operation in New York so am speaking only of the Greater St. Louis area: the Technician has put 6 meters on the map. Six meters here in St. Louis was dead until it was turned over for use by the Technicians. The Air Force Ground Observer Corps in St. Louis is supplied with radio communication by the amateurs on six meters by 44 mobile and fixed stations of which 90% or more are "Video Rangers". As far as experimenting is done by the generals? Here in St. Louis the technicians are doing the following: TV on 420, two-way on 220, RTTY on 50 Mc., etc. I have always been under the impression that the Generals and Technician Class exams were identical except for the code.

— John F. Steffen, KØBVL

39 Victoria Avenue Buffalo 14, New York

Editor, QST:

I am more than a little tired of the treatment we Technicians seem to have to take from the General class, Just where do they think they fit? I wish to remind these lads that we Technicians have taken the same exam they did with the exception that we didn't pound the brass as fast as they did once upon a time. Radio operators exams have become increasingly difficult since most of these lads took theirs. I wonder how many of them are sharp enough to sit down right now and pass the new exams now, even without the code test. I'd be willing to bet, with all their loud boasts, that over 50% of them couldn't re-pass that 13 words a minute if we slipped in on them and gave them a test today.

- Robert E. Kleasen, KõQQA, WA2BYZ

7103 Oak Park Fort Worth 18, Texas

Editor, OST:

I don't know what the Technicians pull in "Yankee Land" but I can sure speak for Texas and that is we have (Continued on page 190)



# Operating News



GEORGE HART, WINJM, Natl. Emerg. Coordinator ROBERT L. WHITE, WIWPO, DXCC Awards PHIL SIMMONS, WIZDP, Asst. Comm. Mgr., C.W.

F. E. HANDY, WIBDI, Communications Mgr.
merg. Coordinator
CCC Awards
Comm. Mgr., C.W.

LILLIAN M. SALTER, WIZJE, Administrative Aide
RONALD GANN, WIFGF, Club Training Aids
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., Phone

Alaska Also to Remain Valid for DXCC. In this department of September QST we announced that Alaska would be a 49th state for WAS when we can announce the legal date by which it officially becomes administratively part of the Union. This is expected to be sometime after the November general election. Stateside and internationally too, Alaska has been sought eagerly for many years in view of its having "country status" in the ARRL Countries List as do other territories at very considerable geographical distances. This DX qualification will remain valid too when Alaska achieves statehood.

Since some may wonder about the basis for examining areas for eligibility to the ARRL Countries List, let us review the considerations customarily weighed by the staff committee in such cases. It has been over three years since we publicized the criteria (page 68, May '55 QST) on which the ARRL Countries List is based. After consulting the topmost political and geographical authorities for facts, the points examined are (1) degree of political-administrative independence, (2) geographical separation, and (3) does the area have "foreign lands between." Note that making Alaska a state makes no change in the latter two criteria. The consideration of remoteness (and Canada between) gives heavy geographical country-implications for Alaska. It should be noted that statehood likewise will increase the weight of political autonomy so that its list-status is thus also strengthened rather than weakened. This is to report that Alaska passed the review of the advisory staff on countrystatus for DX (operating aid 7) with flying colors, so will not lose this status for DXCC.

For the February-March '59 ARRL DX Contest. Invitations to amateurs in other nations are now being mailed. This competition's rules have to be printed before the results of Alaska's November vote to put statehood legally in effect can be known. This would be too late to make contest changes in Alaska's status even if there were good reasons. It clarifies matters to say that in any DX activity, such as the ARRL Feb.-March DX Test, Alaska is considered in her capacity as "an ARRL Country" and not as a state. Deviation from the familiar DX contest pattern would result in overseas misunderstandings and operating confusion. Looked at globally, any change to shift more stations from the DX side to the domestic side would accentuate an existing imbalance, make worse pile ups and a less happy contest operating condition for the majority who take part. Alaska, Hawaii, etc. are authentic listings for a DXCC or the ARRL DX Contest count. So this is just a reminder that Operating Aid No. 7 will be followed; W's and VE's should count Alaska as a countries-multiplier in the coming DX test. Here's where in this coming contest you may get a country and a new state at the same time!

Call for Official Observers. A standing League policy requires maintenance and extension of the Observer service. The primary work of OOs is to help keep you and me and other amateurs clear of citable FCC difficulties in connection with our signals and operation. Activity in mailing the standing observer-type forms, to alert active amateurs, wherever necessary, to look into their difficulties, and accept the responsibilities imposed by FCC regs is required to be an OO. SCMs having completed their fall overhauling of appointments to show activity, are currently looking for experienced amateurs to replace some who have been dropped from the lists.

Observer appointment is not for newcomers. An SCM may give it only to a General Class or Conditional Class (or above) operator who is regarded as having requisite experience and equipment with know-how in checking for images, transmitter stability and the like.

We'll gladly send more information on the Official Observer duties, policy, and sample forms in answer to radiograms or other inquiries. The four kinds of Observer specialties include two grades of frequency precision observers as well as the field-of-activity for c.w. (and RTTY) and the phone signal observing. The League's Board of Directors in recent annual meetings have commended active OOs on their results. W1JNV, W2BLP, W3BJI, W4MGT, W5BKH, W7SFK, W8GFE, W9GFL and W6ADB, KØDEX were reported favorably to the Board at the time of the last annual meeting, as the leaders for their licensing areas in this cooperative program.

In addition to the assistance rendered brother amateurs (and a file of honestly thankful letters attests to the popularity of the service), the OO program helps make our operation a self-menitoring and well behaved service such as in keeping with our high traditions. That this is so is attested by a very recent quotation coming from the FCC itself. "On behalf of the Field Engineering and Monitoring Bureau, I am pleased to acknowledge the fine work that the Official Observers are doing in the interest of self-regulation within the Amateur Service." — Geo. S. Turner, Chief, Field Engineering and Monitoring Bureau.

If you can devote some regular time to OO work, it can help the newcomers and maintain a high level self-service for all amateurs. Standing Information is made available to OOs on receiving appointment from one's Section Manager. For those in a position to make application: Your SCM's full address will be found among those on page 6, this issue of *QST*.

Phone Operation Out-of-Sub-Band Draws FCC Suspension. Starting with July QST we have felt obliged to report in these columns the FCC Amateur Operator License suspensions of more than a dozen different amateurs for various serious infractions of the Amateur Service regulations. The license suspensions were of varying length, from about two months to three and one half years. The six month suspensions for running in excess of one kilowatt input power (included in the list) were the first recorded in QST for some three years. We present briefs of pertinent FCC orders not only as news but to indicate ethical and regulatory practices that other amateurs should take great care to avoid. We're obliged to add to the list this month. The several different causes for recent FCC license suspensions might first be carefully noted, however: (1) For helping another to get a license by fraudulent means. (2) Operating in excess of the legal 1,000 watts input to the final amplifier. (3) For setting an illegal station in operation. (4) For operating at a fixed station location other than authorized by one's license. (5) For using a self-assigned call and work by voice (by Technician or Novice) in the 3.8 or 7.2 Mc. phone bands. (6) For operating after the Novice License expired. (7) For failing to keep a proper log. (8) For failing to post license, and (Novice) using the calls of other stations on the 50-54 Mc. as well as the 144–148 Mc. band.

FCC ordered (August 8, 1958) that the General Class amateur operator license of Jerry A. Spies, Columbus, Ohio BE SUSPENDED for the remainder of the license term which expires May 7, 1959 (about 9 mo.), and that the license be turned in to FCC, it appearing that the licensee by operating his amateur radio station W8QDH with A-3 emission on the frequency 21243.78 kc. which was not available for A-3 emission violated Sec. 12.111(e) of Part 12, FCC Rules, and that he violated Sec. 12.155 of the same rule part in failing to respond to official notices of the foregoing violation.

The Holiday Traffic. We have spot activities for almost every season. However, it is the appeal of exchanging greetings of various sorts, using the message handling side of our amateur radio that is intriguing and a challenge and an opportunity as Thanksgiving and Christmas arrive on the scene. Newer amateurs can well use this season to demonstrate to themselves and others that their stations are truly capable of sending off some messages, for themselves and their families and others. To any experienced amateur worthy of the name, the process of setting down a message in

the form it should be transmitted and getting it on its way from his station should be purely routine. However, to some with little general amateur experience, and no traffic know-how at all, let us offer a few suggestions to help you get in on this Christmas traffic.

Within the United States and Canada we amateurs are fortunate to be able freely to relay and deliver messages, holiday or other, so long as there is no form of compensation, or direct or indirect benefits from our station's work (FCC Sec. 12.102). This is one of the privileges not generally permitted amateurs in most other countries, where radio communications are run as a government monopoly. Those who draw up regulations in other countries probably never stopped to think that the essential difference between a voluntarily handled message and the commercial one is that in the latter the carrier has to quarantee delivery and a good grade of service. It should be said (to ourselves) just in passing, that the appreciation of those who receive any messages. in any service, amateur or otherwise, depends on the accuracy and speed and reliability in delivery. So without being able to offer guarantees on behalf of the reliability of the "other" thousands of amateurs, we all do want to be one with that outstanding group of amateur communicators who have made accuracy and sure delivery the tradition, though depending entirely on selfdeveloped know-how and voluntary means.

We must leave the soliciting of your private messages for yourselves and others to you. The message form, if you don't already know it, can be copied right from page 11 of Operating an Amateur Radio Station or set up by putting the various radiogram parts down on one of the official ARRL message blanks. This will automatically place the elements in the right order to send. Our purpose here is to outline the steps you may take to get your message to another part of the country efficiently by amateur radio.

The Ways and Means. We must recognize (alas) that in a body as large as ours, not all amateurs are equally skilled communicators; some just have interest in technical hobby aspects or are technicians with limited station range and frequencies. (1) The first thought is usually to

# NATIONAL CALLING AND EMERGENCY FREQUENCIES (Kc.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3535, 7050, 14,060; phone — 3765, 14,160, 28,250 kc.

handle the message direct. If you have or can make a schedule with the point of destination with a dependable outlet there, you have it made. To find a reliable operator at the place of destination you may want to look in QST's Station Activities for the calls of traffic stations in the area, or you can listen for "actives" and look up the likely prospects in your call book. (2) An easier solution is to file your amateur radiogram with a local amateur who is an ORS or OPS and has long specialized in sending and receiving messages and knows the ropes. (3) But it's easiest and usually most reliable to start our message on the local ARRL Section Net — one which connects daily through liaison stations with regional and area nets of the National Traffic System. This net frequency and time of operation will be shown in your own section's Station Activities report in many cases; also look it up if necessary in the Net Directory issued annually by the League in printed form. Get on the net, call the NCS indicating you have traffic (and where for), and stand by until the net control station (NCS) tells you what station to give it to. When this station receipts to you for your traffic it is well on its way! (4) A possible variation of this system is to consult the net directory for the time and frequency of a net in or near the place of destination, and to report directly to its NCS. The conditions and limited distances under which casual reporters can successfully break into nets not their own make us suggest that while this is possible, it is ordinarily not the best practice. The main principle to insure the best speed and accuracy on your traffic is to so handle it along the above lines that it will be relayed and delivered by those amateurs who day after day find their fun and enthusiasm in this part of our hobby. Your amateur station can easily be part of this group, and thus part of NTS. The capable instrument of our ready-made traffic net will see your traffic through; by joining it (it takes just a little time each week) one can hardly help becoming a more capable communicator as well as a member of a fine fraternal group.

Numbered Texts and the ARL Check, To assist amateurs along the traffic networks in doing the biggest job with the shortest transmission time, especially in holiday seasons, a list of fixed or standardized texts has been devised. Every League logbook contains in the back a complete list of the ARRL Numbered-Text Messages. These are suited especially to emergency work use and holiday needs, when a peak load of amateur traffic bears seasonal greetings, as always at Thanksgiving and Christmas time. For anyone who doesn't have a log that includes such a list of standard messages from which a selection can be made by the sender, you are welcome to one gratis, with the compliments of ARRL, if requested by radio. We'll be glad to send this list, CD Form 3, printed on the back of a numbersheet (for the next year's consecutive numbering of any messages you start) if you will but send us an amateur radiogram, via NTS or other net, asking for same. Directions and necessary pre-

cautions in using them are given with the list of fixed texts. As an identifier that such a message is coming an ARL appears in both the check and in the text preceding its identifying numeral. We recommend spelling out these and other numerals, always, so that the so-easy-to-make errors will not be made. For Christmas and New Year the 50-70 block of texts is available for your selections. Putting the ARL indicator directly ahead of each number in a text prevents running numbers together if more than one text is transmitted. When one gets a numbered-text message for delivery it is his responsibility as receiving operator always to expand the message and spell it out, since the numbers are merely the system designators, within amateur radio, for those meanings. The numbered-text principle is to facilitate general communication, not to obscure meanings, so the list is in keeping with what is permitted under FCC's Sec. 12.105. While we always prefer the individually-worded message, the ARL-system has helped amateur radio do a bigger seasonal job of handling greetings and emergency messages year after year. So refer to your ARRL log-book list as necessary or ask us to send one for seasonal use at your amateur station. Make it a traffic-Christmas by sending and receiving a few well placed amateur radiograms! -F, E, H.



A preliminary evaluation of the recent Simulated Emergency Test indicates a considerable increase in activity over last year. Reports are just starting to come in at this writing; we are keeping our fingers crossed and hoping that results will bear out our expectations. Which reminds us to remind you: have you sent in your SET report? About 1200 messages have been received from AREC members so far, and there are still more to come.

We want to say something here about "publicity." The SET has two principal objects: first, a test and evaluation of our AREC facilities in cooperation with the agencies we serve, be they Red Cross, civil defense, police, or whatever. The reason for this is to uncover imperfections in our setups and thus be able to take steps to correct them — and in that connection a critique after the test is called for. Now a critique is not a back-slapping or medal-awarding session, and it is not a vehicle for ballyhoo publicity. It is an honest effort to determine how to correct whatever is wrong; and

no organization is perfect.

The second objective is to demonstrate our services to the public. We list this second because it is second in importance — which isn't the same thing as saying it is unimportant. On the contrary, publicity is very important, but let's put first things first, and the first thing we must accomplish is to render a service, the best possible, most efficient service of which we are capable, whether anyone knows about it or appreciates it or not. Then and only then can we seek publicity, praise, flowers and other rewards, tangible and intangible, for our efforts. Most efficient AREC organizations will find that efforts to obtain publicity are unnecessary. It comes spontaneously with service rendered. We have no brochures on "how to obtain publicity for your AREC group." All we have is information on how best to render an efficient service.

On numerous occasions we have received requests (sometimes demands) for "publicity in *QST.*" Information accompanying such a request is sometimes usable, sometimes not. The decision is usually an editorial one—that is,

#### NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc.

7140 kc.

These frequencies are employed throughout the United States by amateurs using radioteletype.

whether or not the subject is considered to be of enough interest to enough QST readers, based on subject matter, illustrations, style, and general readership. This kind of "publicity," if it appears in this column at all, usually rates a rather low priority, because this column is not a publicity column. It is a chronicle of amateur achievements in emergency communications. What publicity results is inherent in the account of services rendered — first, in an actual emergency, second, in a test, drill or public activity, and third, in plans and preparations for rendering an emergency communications service.

This is not to say that descriptions of AREC or RACES setups are automatically thrown out the window. Oh, no! They are considered for "up front" publication in QST but as mentioned above, strictly on an editorial basis. Many such articles have been printed, and we are always on the lookout for more. If you have an organization of which you are proud (and we hope you have), write it up in some detail, send along some pictures (of amateurs and their equipments) and other illustrative material. We earnestly solicit such material and will be delighted to consider it for QST, but promises of publication we cannot make until we have seen it and studied it.

It seems that we no sooner set up our list of SECs for publication in October QST than a number of changes were made by SCMs. So please correct your October QST lists as follows: The Western Florida SEC is W4PQW (our apologies for this one — he was inadvertently left out); for Md.-Del.-D. C., change W3CXG to W3YYB; for Rhode Island, change W1PA to W1PAZ (this one was our fault too); for Idaho, change W7IWU to W7OCR; for West Virginia, change W8KXD to W8HZA; for Canal Zone, change K2SRB to KZ5RV (bad proofreading); for Northern Texas, change W3BNX to W5AEX; for Oklahoma, change W5LXH to K5KFS; for Indiana, change W9CMT to W9SNQ; for North Dakota, change W $\emptyset$ CAQ to K $\emptyset$ JLW; for Santa Barbara, delete K6CVR (no replacement as yet).

On Sept. 9, units of the Berrien County (Mich.) AREC were alerted at 2215 EST by the Red Cross, following news that a wind and rain storm had completely disrupted communications in the village of Hartford, Mich., 20 miles northeast of Benton Harbor. Two Berrien County Emergency Units were alerted immediately, one on 6 and the other on ten meters. At 2230, five mobile units were en route to the scene of the emergency. By 2255 communica-

tions had been established in the stricken area and between Hartford and Benton Harbor. News releases were handled and traffic between the stricken area and Red Cross head-quarters in St. Joseph was handled by the two nets, one on 6 and one on 10 meters. The last mobile unit left the area at 0100 Sept. 10, when limited telephone service was established. Up to that time, the amateur mobiles had been the only means of communication with the stricken areas. The following mobile units took part: W88 QQO TWS, K88 BLIL LAP ADS. Two additional mobiles were standing by but were not needed. — W8QQO, EC Berrien Co., Mich.

Orange County, Texas, experienced a rainy September, but the 4-inch deluge on Sept. 20 caused the Sabine river to overflow and create serious flooding conditions. K5BJB was called by the local club president at 0500 on Sept. 21 and told that Orange was under 2-4 feet of water. The Orange Amateur Radio Club went into action. W5NMV was used as net control, with W5ICL operating. Other stations were put on the air from Central Fire Station (K5PUD), from the Red Cross (K5RTR), from Stark High School (K5ROA and K5RJQ), from radio station KOGT (K5HMB and K5PIH), from the U.S. Naval Base (W5EXK) and from the National Guard Armory (K5OSX). K5EVE and K5RAE stood by in Orangefield. Club station W5ND was manned by K5PUH and K5OYJ. Mobiles in motion were K5s ROB SCU PUE and BJB. Relief operators were W5s OQG SOA and QLE.

Telephone service was overloaded or completely out in many places. Communications handled by the amateur group had to do with evacuations from flooded areas, arrangements for food and shelter, and delivery of messages to places which were without communication. One mobile took a doctor out to deliver a baby. All highways to Orange were closed until the following day. By 1600 on Sept. 21 things were getting back to normal so we all went home feeling satisfied that amateur radio had done another good job of emergency communication. — KōBJB, EC Orange County, Texas.

The Florida Midday Traffic net was interrupted on August 9 when K4SZC reported that W4HCG had been overcome by fumes from a chemical compound he had been using. The details of the efforts of the net members to ascertain just what had been in the poisonous compound and how it should be treated, involving doctors and hospitals as well as chemical distributors, are too long and involved to go into here. Suffice it to say that through the efforts of the net the necessary information was obtained and the stricken man properly treated. Twelve net members took part in the activity, along with a number of monitoring stations who broke in with helpful suggestions from time to time. — K4AKQ, FMTN Manager.

Eight amateurs of the Warren County (N. Y.) AREC group assisted in providing communications for the 88-mile marathon boat race on Lake George, Aug. 17. Units were all operated mobile and were located at key spots on the lake, maintaining constant contact with the judges and radio



Members of the Los Angeles County
Disaster Authority RACES group put on
a public display of amateur radio at
the Los Angeles County Fair, Pomona,
Calif., Sept. 12 to 28. Operation was
by phone, c.w. and RTTY, 1¼ through
160 meters. Shown at the operating
position are W6ONC, chief radio officer; K6OQD, radio officer San Dimas
District; and K6AXC, deputy communications officer. Official photo, Los Angeles Co. Sheriff's Dept.

OST for



The Galveston County (Texas) Communications trailer is equipped for 2, 6 and 75 meter RACES operation, with a 5-kw. generator trailing. Shown posed in front of it are: W5QJD, alternate r.o.; Rusty Thomasson, communications head; W5WYK, alternate r.o.; W5JSU, r.o.; K5EHZ, alternate r.o.; and Col. J. T. Cain, county c.d. director.

station WIPS. —  $K2EED,\ EC\ Warren\ Co.,\ N.Y.$ 

Members of the Cascade County (Mont.) AREC, all of whom are also members of the Great Falls Radio Club, provided communications during the annual Junior Chamber of Commerce Trout Derby on Aug. 24 along a 12-mile stretch of the Missouri River. Mobile and hand-carried units patrolled the river to report fish catches, direct traffic and provide transportation for officials. W7WRK acted as control station, and EC W7ZUQ collected information on the activity and submitted it to radio stations and newspapers. Thirteen amateur stations participated. — W7KUH, SEC Montana.

Amateurs from Fort Walton Beach and nearby Eglin AFB, Fla., assisted the Fort Walton Police Dept. on Labor Day week end in handling communications during two parades, one on Aug. 30 and the other on Sept. 1. A portable station was set up next to the police dispatcher in City Hall, operating on 29,560 kc. by W4BPJ and K4JUA. Mobiles were positioned at various intersections, plus an additional mobile in the parade itself to report parade progress. The seven amateurs who took part are all members of the police auxiliary and will be called on for similar jobs in the future. — W4RKH, SCM W. Fla.

The Arlington County (Va.) AREC just received a 3500-watt and three 2500-watt emergency power generators, with more on order along with some other equipment. The aim is to have two duplex RTTY stations, a central control station complete with towers, and a communications trailer. The RTTY equipment will be for handling traffic to out-of-county points. This equipment all belongs to Arlington County AREC! It is part of a preparedness plan for Arlington County AREC initiated and supplied by the amateurs themselves and spark-plugged by W@RKO/4 and EC K4MJZ. The AREC members are doing it themselves, supplying their own equipment and facilities. Last winter, Arlington County had 100,000 homes without power and 10,000 without telephones during stormy and snowbound conditions. This year, the AREC will be prepared.

It isn't easy to work up an organization like this without subsidy by some government or commercial organization. Our hats are off to K4MJZ and his gang for showing that it can be done without help where the need is apparent and there is no other amateur facility organized.

We received twenty SEC reports on August activity, representing 6095 AREC members. This is 'way below the record-breaking 27 reports for 7009 AREC members we received in August of last year, but it beats August of 1956, if that's any consolation. Reports were received from the following sections: W. N. Y., New Mex., Conn., Minn., San

Joaquin Valley, Ga., Mont., E. Fla., Wis., East Bay, Santa Barbara, Colo., Ala., Santa Clara Valley, So. Texas, NYC-LI, Wash., E. Pa., Maritime, Ont.

A note to SECs: don't be so lazy. A report that is scrawled "same as last month" is not a report. Fill it in, will ya, huh? If you're not making any progress, at least fill in the numerical data so we don't have to go to our back-report file to find out how many AREC members you have. In the case of one section, we discovered that the SEC has been scribbling "same as last month" on his reporting form for a year and a half. This is a report?

#### RACES News

During the late lamented SET, we were glad to note a greatly increased participation on the part of OCDM, both at regional and national level. We think that, for the most



part, they received enough traffic to make the effort worth their while. Details of this and other participation in the SET in the subsequent QST writeup, but meanwhile we wanted to mention that OCDM Regions One, Three, Four, Six and Seven took active part in the SET on the National Calling and Emergency Frequencies, and we have already received rundowns from

the respective communications officers of some of those regions on their participation. National OCDM head-quarters at Battle Creek, Mich., was also represented during the week end. This demonstrates a high degree of RACES-AREC coordination at the federal level which we find most gratifying and which inevitably must result in a better all-around emergency communications service in the PICON. So, fellows, get your AREC and RACES programs together at your level, if they are not already in close accord. Parallel or competing services cannot possibly do the job as well as two services working as one.

During the three-day Labor Day week end the Burlington County RACES participated in a combined mobile drill and public service when, on August 29, ten amateurs assisted in patrolling the highways. The station at the county's RACES headquarters in Mt. Holly served as net control station, and liaison was maintained with sheriff's radio cars as well as with state and municipal police in the county. When two meter mobiles were out of range of the NCS, fixed relay stations were used to provide the contact. Amateurs in their mobiles had no authority except to report, but some carried police officers. Several alerts regarding stolen cars were made available to the RACES mobiles, and in one case an abandoned car was discovered and investigated. Eleven mobiles were active, while six operators manned the control station. Three amateurs served as relay stations, and five additional stations reported into the The activity was organized by W2WKI, radio coordinator for Burlington County C.D.

Washtenaw County (Mich.) Civil Defense held a mass evacuation of two townships on Sept. 7, in which RACES was assumed to be the only means of communications available. All seven zones of the c.d. setup were hooked up on 2 meters. Eighty-four messages were received from head-quarters, 97 were delivered at headquarters and sixteen were on the hook at the close of the drill. The c.d. bus was stationed on a hill in Ann Arbor, about 2 miles from the county building and handled all traffic emanating from the county building on two separate two-meter frequencies. A few mobiles were also working on ten meters. — W8JYJ, RO Washtenaw County, Mich.

Los Angeles County RACES had another large-scale operational test on Sept. 28, called "Operation Black Top II." Emphasis in this exercise was on controlling mobiles from other mobiles and portables representing c.d. head-quarters. RACES groups from the cities of Los Angeles, Beverly Hills, Burbank, Long Beach, Claremont, Covina and Pomona also participated, involving over 225 mobiles and over 500 individuals, piling up an aggregate mileage of over 1200 miles over an area approximately the size of the state of Connecticut. Operation commenced at 1200 when mobiles and portable units reported to their local disaster stations. From there they proceeded to seven staging areas, where the smaller units were joined into major convoys. These convoys then proceeded to the assembly point in the

San Gabriel mountains, maintaining intercommunications en route, also receiving instructions and reporting progress from "Operation Command." Despite long distances and varied terrain, contact was maintained at all times. Operation Black Top II was developed by W6QJW, dpputy chief r.o. for Los Angeles County, and was implemented by W6ONC, chief r.o., and carried out by county staff radio officers W6AEJ, K6VJU, K6AZJ and K6AXC. W6KQ, director of communications for Los Angeles County, also participated.

With over 600 members and an average weekly check-in of over 400 units, the Los Angeles County RACES group claims to be the largest in the United States, and the success of Operation Black Top II was largely due to the work of its district communication and radio officers who deserve to be named here: W6s WYH ILW UTY ORM TLI MCV TYN QYY POP GWO MTI NTN GHJ PNN EVL LVX SVU QYW EAH SEE, K6s SSG EFU ICD OPD and ABN. W6LIP commanded operational area "A", including the cities of Los Angeles, Santa Monica and Beverly Hills. The Burbank unit was commanded by W6JYP. Operational area "D", including Claremont, Covina and Pomona, was under W6PQH. — W6QJW, Deputy Chief R. O., Los Angeles Co. Disaster Authority.

#### A.R.R.L. AFFILIATED CLUB HONOR ROLL

This Honor Roll is published as a special recognition for all affiliated clubs whose  $entire\ membership\ consists$  of members of the League. We are here pleased to present the second Honor Roll listing for 1958. See page 96 of June QST for the earlier listing of those affiliates with 100 per cent ARRL membership. Our honor list is prepared each time on analysis of data received in connection with each club's returned early.'58 Annual Report. This coming January or February a new survey form will be sent every active ARRL–sffliated radio club for the annual filings on which continued affiliation and our QST listings are based. These following Honor Roll clubs also now will receive our "100% ARRL–Club" certifications following publication of this listing in QST:

Amateur Transmitters Association of Western Pennsylvania, Inc., Pittsburgh, Pa.

Bandhoppers Radio Club, Ferguson, Mo.

Blossomland Amateur Radio Association, Inc., St. Joseph,

Brawley Radio Amateur Club, Brawley, Calif. Central Alberta Radio League, Alberta, Canada The Central Illinois Radio Club, Inc., Bloomington, Ill. Central Texas Amateur Radio Club, Inc., Duncan, Okla. Coffee Dunkers, Detroit, Mich. Concord Brasspounders, Concord, N. H. Cranston Amateur Radio Association, Cranston, R. I. Davenport Radio Amateur Club, Inc., Davenport, Iowa Door County Amateur Radio Club, Sturgeon Bay, Wis. Fountain City Radio Club, Fountain City, Tenn. Illinois Valley Radio Association, La Salle, Ill. Marshall Radio Club, Marshall, Minn. Northeast Radio Club, Philadelphia, Pa.

Queen City Emergency Net, Inc., Cincinnati, Ohio Radio Amateur Club of Belleville, N. J. Sandusky Valley Amateur Radio Club, Fremont, Ohio Scott County Amateur Radio Club, Scott City, Kansas Suprise Radio Club, Inc., Cambria Heights, N. Y.

Palmetto Amateur Radio Club, Inc., Columbia, S.C.

Scott County Amateur Radio Club, Scott City, Kansas Sunrise Radio Club, Inc., Cambria Heights, N. Y. The Thirteen Amateur Radio Club, Vancouver, B. C.,

Treaty City Amateur Radio Assn., Greenville, Ohio Valley Radio Club, Eugene, Ore.

Vanderburgh Amateur Radio Emergency Service, Evansville, Ind. Victor Valley Amateur Radio Club, Victorville, Calif.

Victor Valley Amateur Radio Club, Victorville, Calif. Wichita Amateur Radio Club, Wichita, Kansas York Road Radio Club, Philadelphia, Pa.

#### TRAFFIC TOPICS

A lot of traffic was handled by a lot of amateurs during the SET, and we regret to say that some of it was handled pretty sloppily. One thing we have noticed is the frequent use of the word "same" in handling messages which have identical parts. The only time that this word should be



Here is the station of G. W. Carson, W9LLZ, Asst. EC in Chicago, who runs a net on 147.5 Mc. in that area containing 35 members. The big relay rack contains the 2-meter gear using a commercial exciter and a home-brew final running 550 watts input. Equipment is also available for operation on 29,640 kc.

used is when it actually appears in the message. Otherwise, it can lead to confusion and is an open invitation to garbling and misrouting. If you have a batch of traffic in which some part is the same in each, use the "book" message form. If you don't want to do this, then send the whole message each time. Don't say "same."

Even some so-called "good" traffic men do this. But the receiving station, after the traffic is copied, must figure out what the "sames" are the same as, and if they take different routings, as they usually do, he must recopy texts, addresses, preambles, or whatever parts of the messages are identical, before he can pass them on and properly file them. It makes for general messiness, is always unnecessary and invites errors. The only reason it is used is because the sending station is lazy or doesn't know how to put the traffic in "book" form, or both.

The principles of book messages were explained in this column in July, 1957, QST. They are very simple: indicate that a "book" is coming (and state how many are in the book), then transmit all the parts common to all the messages in the book; after that, transmit the parts that are different to each message. See July 1957 QST for complete details.

We have had arguments that the reason amateurs send "same" instead of using the book form is that this way they get more message credits. In this they are erroneous. They may take more message credits, but they are doing so against the rules. To count in your ARRL traffic total, messages must be handled in "standard ARRL form." Use of the word "same" is not standard ARRL form. Standard procedure is to use the book or send each message separately and completely. There may be some traffic men who handle traffic just to run up a big score, but we don't recommend this as a sole reason for being in traffic work, any more than we urge amateurs to get ORS appointments just so they can take part in CD Parties. If you count traffic containing the word "same" in your traffic total, you are taking false credits.

So, you ask, what can you do when someone sends you traffic and uses this forbidden word? Well, if you want to be real nasty you can tell him to stand by while you recopy the whole thing; and you have good and sufficient justification for doing this, because you want to make sure you don't get mixed up in passing the messages along or delivering them. In order to keep your friends, however, you may want to clip all "sames" together carefully and recopy them after the contact has been completed, at your leisure. Then, in passing them on, you can rearrange them into books as indicated. If you do this, we'll allow you to count them in your traffic total. But the sending station in this case would be claiming traffic points he did not earn if he counts each of the messages he used "same" in as a separate relay.

The gist of this tirade is as follows: let's eliminate the use of the word "same" in our traffic handling unless it actually appears in the body of the message. It is one of those timesavers that are efficiency-wasters. And if you catch someone

100 QST for

#### BRASS POUNDERS LEAGUE

Winners of BPL Certificates for September traffic:

willners of DE	L Certii	icates 10	r septe	mper tr	ame.
Call	Orig.	Recd.	Rel.	Del.	Total
W2KEB	238	1696	1392	258	3584
W3CUL	225	936	702	214	2077
WØSCA	36	788	775	4	1603
WØBDR	51	785	675	13	1524
K4SJH	147	647	549	11	1354
W7BA	15	599	573	$\hat{2}\hat{4}$	1211
W8UPH	. 21	568	526	41	1156
K6HLR		534	463	48	1108
WIUEQ	335	328	271	53	987
K5FHU	41	440	431	45	957
WØIA	98	488	404	4	924
W9CXY	23	439	415	$2\hat{4}$	882
WØLGG	70	414	358	34	876
K6YBV	50	420	390	15	875
W9NZZ	200	309	0	309	818
WØPZO	14	392	376	10	792
W5RCF	$\stackrel{\cdot}{_{\cdot}}$ $\stackrel{\cdot}{_{\cdot}}$ $\stackrel{\cdot}{_{\cdot}}$ $\stackrel{\cdot}{_{\cdot}}$	380	363	17	787
W9DO	19	368	333	54	774
W7PGY	. 19	341	307	29	696
W9VAY	. 21	329	310	6	666
K6CPT	14	325	101	200	640
W6GYH	161	243	195	35	634
W4PFC	21	299	281	29	630
KØDNM	42	293	288	5	628
K4EZL	162	241	189	31	623
K200K	200	199	164	14	577
K2SIL	32	275	256	- Ŝ	568
K4ELG	26	283	222	37	568
K1AQB	20	254	250	4	528
K4QIX		247	178	66	520
WØCPI	23	$\frac{257}{257}$	247	10	517
Late Report:		~01	- 11	-0	011
WØIA (Aug.)	29	460	370	3	862

#### More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
K5WSP		403	321	80	1014
W6YDK	. 13	265	252	13	543
Late Report:	. 29	889	877	16	1811

BPL for 100 or more originations-plus-deliveries
K6GZ 299 W4BZE 120 K1BCS 100
W2JGV 182 WKJZ 120 K4KZP 102
K9GDQ 149 W8GFE 116 KØKYK 102
W4SHJ 140 W9PCQ 109 Late Reports;
K5DUJ 138 KØIRL 106 K4DRO (Aug.) 123
K2PTS 131 W2ATC 104 W4PVE (Aug.) 123

#### More-Than-One-Operator Stations K9CLU 443 WØDVL 181 W1AW 102

K9CLU 443 WØDVL 181 W1AW 102

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: W1CMH, K2DVT, K4DSD, K5FJA, KØIDV.

The BPL is open to all amateurs in the United States-Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations plus deliveries for any calendar month, All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARBL form.

else doing it (who either doesn't read period, or who doesn't read this far into the fine print), refer him to this column, this issue, or to the July, 1957, issue.

Net Reports. Hudson Traffic Net held 27 sessions, had 155 QNIs and handled 102 messages. Transcontinental Phone Net reports: 1st Call Area, 1776; 2nd Call Area, 1791; 4th, 5th, 8th, 9th and 9th Call Areas, 476; total, 4043. Early Bird Transcontinental Net held 30 sessions, handled 727 messages. Interstate Single Sideband Net held 30 sessions, had 1283 check-ins, handled 612 messages in an average session time of 51 minutes.

National Traffic System. We are still getting traffic, presumably sent over the system, which is entirely too old. In every case in which this has been investigated the fault is found to lie, as it inevitably must, not in the system as set up but in its improper implementation. Somewhere along the line, someone goofed. A liaison was not made, a TCC schedule was not kept, net operating times did not coincide to effect an efficient transfer. In every case the system, had it been properly implemented, would have resulted in the message having made good time.

This puts us back on an old theme: net operating times in NTS were designed to effect the most efficient transfer of traffic from one net to another. If concessions to members' operating conveniences are made to change these times (as they often must be), there will usually be a flaw somewhere along the flow pattern. True, it is better to have a net operating at the wrong time than not to have a net operating at

all, if it comes to that, but often we suspect that an NTS net operating at a time other than that specified in the NTS plan does so from force of habit, has a tendency to collect operators who can operate at that time rather than at the right time, and that no thought is given to the possibility of changing the net to its proper operating time and finding operators who can operate at that time. This makes for an anomolous situation in which the regular flow of traffic from section to region to area to TCC to area to region to section cannot be followed. Result: delays, reroutings (often misroutings), taking traffic off of NTS routes to be put on other routes which can (maybe) get it to its destination faster.

NTS is unique among traffic routes because its operation can be and is described in terms of functions, not individuals. The individual performs a certain function once, or maybe twice a week, but at other times the same function is performed by someone else. If we are to derive maximum benefits from such a setup, the convenience to the individual must be considered secondary to the function to be performed. This means that we must find the individual to perform the function, not to tailor the function to fit the individual's convenience. Where some flexibility is possible, the latter can sometimes be accommodated, at least to a limited extent. Mostly, we have to depend on finding traffic men who can fit into the schedule.

One of our greatest needs is for good c.w. traffic handlers. There are lots of excellent c.w. operators, contrary to popular belief that phone is gradually taking over ham radio traffic (as well as most other specialties). If you don't believe it, take a listen to some of the sharp operating in our "big three" contests - by amateurs that you and I never heard handle a message. Seems a terrific waste of talent to see all those good ops playing when they could be doing something useful. We should be able to entice some of them into NTS. You NTSers, if you have an opportunity, ought to work on them once in a while. One night a week would be enough. Appeal to their vanity and, if they have no sense of dedication, to their desire for individual glory (as a denizen of the BPL or holder of a net certificate or even a net manager's certificate). It might work on some of them. And some of them may decide that traffic handling is actually fun. and stay with it.

September Reports:

Net	Ses- sions	Traffic	Rate	Aver- age s	Repre- entation(%)
EAN	23	1027	.882	44.6	97.1
CAN	30	807	.658	26.9	100.0
PAN .	30	1064	,536	35.5	93.3
1RN	25	318	.311	12.7	$85.7^{1}$
2RN	51	496	.342	9.7	97.6
3RN	44	383	.366	8.7	74.2
4RN	51	491	.263	9.6	62.2
RN5	52	437	.229	8.4	91.3
RN6	33	496	.330	15.0	83.3
8RN	44	156	.150	3.5	86.4
9RN	44	1197	.666	27.2	81.8
TEN	74	766	.285	10.4	62.7
ECN	22	64	.215	2.9	$67.7^{1}$
TWN	22	186	.166	8.5	$70.9^{1}$
Sections <sup>2</sup>	897	6403		7.1	
TCC East	$75^{3}$	143			
TCC Central	$60^{3}$	650			
TCC Pacific.	$107^{3}$	777			
Summary	1442	15,861	EAN	9.9	CAN
Record	1142	12,369	.692	15.4	100.0

<sup>1</sup> Regional net representation based on one session per night; others are based on two or more.

<sup>2</sup> Section nets reporting: AENT, AENP & AENB (Ala.); SCN (Calif.); QMN (Mich.); GSN & GAN (Ga.); CN & CPN (Conn.); HNN & CWXN (Colo.); MDD (Md.-Pel.-D.C.); NJN (N. J.); SMN (Md.); TLCN (Iowa); Iowa 75 Phone; S. Dak. CW, S. Dak. 40 Phone & S. Dak. 75 Phone; WSN (Wash.); ILN (Ill.); SCN (S. C.); WVN (W. Va.); VN (Va.); KYN, KPN Morning & KPN (Ky.); FMTN, Gator & FN (Fla.); MSN, MSPN Noon & MSPN Evening (Minn.)

<sup>3</sup> TCC functions reported, not counted as net sessions.

No doubt most of our nets have at one time or anothe had stations reporting in who are willing to undertake any assignment simply by making themselves available to the NCS for whatever needs to be done. They may be used for QNB purposes, to QNG if the NCS should have to rush off for any reason, to take a liaison to a higher echelon if the regular for that purpose doesn't show or is overloaded, or for any other of a number of uses. The Sixth Regional Net under its new manager, K6HLR, has adopted the practice of assigning a "utility" man to each session for just such purposes. It's a good assignment and it takes a good man to fill it, because he has to be ready for almost anything. He might find that the NCS doesn't show up (egad, does this happen?), in which case he's it. Or, if the regular station assigned to go to the area net doesn't show, there's another chore for him. On RN6 they have a rule that if net stations QNI with more than 15 for the area net, the utility station is called on to help out and take any excess to the area net. In addition, he is expected to monitor the area net, and if he finds that the traffic for RN6 is heavy he will QNI and help clear it, then take it back to RN6's late session.

Not a bad system, eh? Maybe all NTS nets ought to have, in addition to a NCS and a liaison station, a "utility" station on regular assignment to take up the slack when the going gets rough, as it often does especially on regional and area nets. Also, being assigned utility man will be sort of like being handed a surprise package — you won't know what's in it until you open it. These things keep life from

being boring.

K6DYX, having been elected SCM, also elects to relinquish his PAN managership (chicken!); PAN certificates have been issued to K6SXA, W7s OCX QLH ZB VIU and W9WMK. First Regional Net certificates have been issued to the following: W1s FJJ GPY IHN HKA MTX WVV ZPB/I, K1s BYL BGC; IRN is now conducting a Sunday session on trial. W3UE says that the mailman is still making BPL on deliveries to Pennsylvania and Delaware. K6HLR starts his term as RN6 Manager with a fine bulletin to all regular participants, outlining policies and procedures in definitive terms; K6YBV is assistant manager.

Transcontinental Corps. The following have received TCC certificates for their work in Eastern Area TCC: W1s AW EMG NJM TYQ. W2s HDW VDT ZRC, W3s COK LXU, K4KNP, W9DO. Our October chart of Eastern Area TCC showed ten vacancies (out of 28 possible assignments). Anyone interested, contact W3WG. There are no vacancies (except as alternates) in Central Area, and three vacancies (all on the week end) in the Pacific Area. Good c.w. men with traffic savvy are needed.

October reports:

Area	Functions	$\begin{array}{c} \textit{Out-of-Net} \\ \textit{Traffic} \end{array}$		
Eastern Central Pacific	75 60 104	$89.3 \\ 100.0 \\ 94.2$	1382 683 1518	143 650 777
Summary	239	94.1	3583	1570

The TCC roster: Eastern Area (W3WG, Dir.) — W18 EMG AW NJM, W28 HDW VDT, K2SIL, W38 COK LXU WG, K4KNP, W9DO. Central Area (WØBDR, Dir.) — W98 LCX SCA BDR LGG, W9CXY. Pacific Area (W6BPT, Dir.) — W5DWB, W68 ADB PLG BPT EOT VZT UTV HC ELQ ZRJ YHM, K68 DYX ORT EWY HLR GES GID, W78 VIU GMC ZB, WØKQD.

#### **ELECTION NOTICE**

(To all ARRL members residing in the Sections listed below.) You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. The notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date 38 La Salle Road, West Hartford, Conn.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

Dec. 10, 1958 W. R. Williamson

SCM

Closing Date

Section

Yukon\*

Present

Term Ends

Mar. 17, 1949

West Indies	Dec. 10, 1958	William Werner	Aug. 10, 1958
Idaho	Dec. 10, 1958	Rev. Francis A. Peterson	Oct. 10, 1958
Vermont	Dec. 10, 1958	Mrs. Ann L. Chandler	Oct. 10, 1958
Colorado	Dec. 10, 1958	B. Eugene Spoonemore	Feb. 11, 1959
Minnesota	Dec. 10, 1958	Robert M. Nelson	Feb. 17, 1959
Michigan	Dec. 10, 1958	Thomas G. Mitchell	Feb. 17, 1959
Eastern			
Florida	Dec. 10, 1958	John F. Porter	Feb. 21, 1959
Sacramento			
Valley	Dec. 10, 1958	LeVaughn Shipley	Feb. 25, 1959
Missouri	Dec. 10, 1958	James W. Hoover	Mar. 1, 1959
British			
Columbia*	Jan. 9, 1959	Peter M. McIntyre	Mar. 13, 1959
Maryland-			
Delaware-			
District of			
Columbia	Jan. 9, 1959	Louis T. Croneberger	Mar. 21, 1959
Hawaii	Feb. 10, 1959	Samuel H. Lewbel	Apr. 10, 1959
Nebraska	Feb. 10, 1959	Charles E. McNeel	Apr. 15, 1959
Los Angeles	Feb. 10, 1959	Albert F. Hill, jr.	Apr. 18, 1959
Wisconsin	Mar. 10, 1959	George Woida	May 12, 1959
Connecticut	Mar. 10, 1959	Victor L. Crawford	May 23, 1959
Oregon	Mar. 10, 1959	Hubert R. McNally	May 28, 1959
Mississippi	Mar. 10, 1959	John Adrian Houston, sr.	May 29, 1959
T. T. T. C. T. L. T. T.			- '

\*In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

#### **ELECTION RESULTS**

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Northern New Jersey Edward Hart, jr., W2ZVW Oct. 10, 1958 Oct. 15, 1958 Ulmon M. Goings, W5ZZY Arkansas Santa Clara Valley William C. Smith, K6DYX Oct. 15, 1958 Mrs. June R. Burkett, W1VXC Oct. 15, 1958 Rhode Island Robert H. Wright, W1RMH Oct. 26, 1958 New Hampshire Western Massachusetts John F. Lindholm, W1DGL Nov. 10, 1958 Southern Texas Roy K. Eggleston, W5QEM Dec. 10, 1958

In the Kansas Section of the Midwest Division, Mr. Raymond E. Baker, W0FNS, and Mr. Roy T. Stromberg, W0MEF, were nominated. Mr. Baker received 208 votes and Mr. Stromberg received 195 votes. Mr. Baker's term of office began Oct. 29, 1958.

#### WIAW OPERATING NOTE

The complete W1AW operating schedule which became effective October 26 appeared on pp. 89–90 of last month's QST. See that issue for full details on when and where to look for the ARRL Headquarters Station.

Printed master schedules listing W1AW operation in EST, CST or PST are available on request. Also, a map showing how to get to W1AW from local highways will be sent to amateurs advising of their intention to visit the station.

OST for

#### A.R.R.L. ACTIVITIES CALENDAR

Dec. 3: CP Qualifying Run — W6OWP Dec. 23: CP Qualifying Run - W1AW Jan. 8: CP Qualifying Run — W60WP Jan. 10-11: V.H.F. Sweepstakes Jan. 17-18: CD QSO Party (c.w.) Jan. 21: CP Qualifying Run — W1AW Jan. 24-25: CD QSO Party (phone) Jan. 31-Feb. 15: Novice Roundup Feb. 4: CP Qualifying Run — W60WP Feb. 6-8: DX Competition (phone) Feb. 13: Frequency Measuring Test Feb. 19: CP Qualifying Run - W1AW Feb. 20-22: DX Competition (c.w.) Mar. 5: CP Qualifying Run — W6OWP Mar. 6-8: DX Competition (phone) Mar. 19: CP Qualifying Run — WIAW Mar. 20-22: DX Competition (c.w.) June 27-28: Field Day

#### OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of QST issue in which more details appear.

Nov. 22-23: 21/28 Mc. Telephony Contest, RSGB (p. 68, last month).

Dec. 6-7: West Virginia QSO Party, Kanawha Radio Club (p. 164, this issue).

Dec. 7: Wisconsin QSO Party, Milwaukee Radio Amateurs' Club (p. 136, this issue).

Dec. 12-14: Vermont QSO Party, Tri-County Amateur Radio Club (p. 154, this issue).

Dec. 13-14: Massachusetts QSO Party, Merrimack Valley Amateur Radio Club (p. 150, this issue).

Jan. 9-11: WAE DX Contest (c.w.), DARC (next month).

#### CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on Dec. 23 at 2130 Eastern Standard Time. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,600 kc. The next qualifying run from W60WP only will be transmitted on Dec. 3 at 2100 PST on 3590 and 7128 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs for ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m.

you may try later for endorsement stickers. Code-practice transmissions are made from W1AW each evening at 2130 EST. Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date Subject of Practice Text from October QST

Dec. 1: Remote Control of a Grid-Dip Meter, p. 15

Dec. 4: A Versatile 50-Mc. Transmitter, p. 16

Dec. 9: Simple Low-Pass Filter Design, p. 21

Dec. 12: An All-Electronic Key and Keyer, p. 28 Dec. 16: How I Come to Be a Ham, p. 49

Dec. 18: June V.H.F. Party Summary, p. 88

Dec. 22: Official Results . . . DX Competition, p. 50

Dec. 30: Operation Alert, 1958, p. 70

#### MEET THE SCMs

Samuel H. Lewbel, KH6AED, SCM of Hawaii, originally was licensed in 1931 as W2BKR.

He has participated in ARRL Sweepstakes and Field Days and was elected "Ham of the Year" at the 1957 Territorial Amateur Radio Convention held in Honolulu. A member and past-president of the Honolulu Amateur Radio Club he also is active in the Territorial C.D. Agency and as a Radio Officer in RACES. He wrote and successfully pushed through the Bill to permit the use of ham call letter plates in Hawaii.



Besides the big kw. final with an 833, KH6AED has a pair of 826s on 2 meters with an eight-element antenna, works mobile on 10 and drives the big rig with a Viking Ranger using a 20-A for s.s.b. A Boehme keyer and Wheatstone perforator are available for his code practice sessions and a Model 14 is used for RTTY. For emergency use a 1.5-kw. gas generator is on hand. Receivers are an HRO-60 and a BC-639.

#### CONTEST NOTES

Last chance to get your 25th ARRL Sweepstakes log in! It has to be postmarked by December 3 to insure eligibility for awards and listing in the QST official results.

Certificates for all winners in the 24th ARRL International DX Competition (final results in October *QST*) were mailed November 5.

Four boo-boos in the summary of the June V.H.F. QSO Party (p. 88, October) have been brought to our attention. The tabulations for San Diego and Santa Barbara Sections, omitted from Southwestern Division, should have appeared as follows:

#### San Diego

W6ZOP/6......4050-405-10-AB K6COE.......616-88-7-AB

#### Santa Barbara

W6PFE/6 (W6s GQB PFE KN6OOZ) 1904-238- 8-AB

The call of K2IXB, fifth in Western New York with 427 points, was erroneously shown as K2IXR.

To all concerned, we hasten to extend our apologies.

#### CLUB COUNCILS AND FEDERATIONS

Affiliated Council of Amateur Radio Clubs, Lyman Rinker, W7AZD, Secy., 3734 N.E. 66th Ave., Portland 13,

British Columbia Amateur Radio Association, George R. Kitson, VE7ALE, Secy., 389 E. St. James Rd., North Vancouver, B. C., Canada.

Indiana Radio Club Council, Inc., Fred Sawyer, W9FJI,

Secy., 526 South Gibson St., Princeton, Ind. Michigan Council of Cluts, Roland R. Beineman, W8QBA, Secy., 136 Guild St., N.E., Grand Rapids 5, Mich. DX Century Club The following list contains the call letters and countries totals of all holders of the Postwar DX Century Club award as of September 30, 1958. The calls of new members as well as those receiving endorsement credit during the period September 1 through September 30, 1958, are included in this listing.

• 286 Wilein	• <b>266</b> W6TI	W3ECR W3EPV	K6ENX W6HX	I1SM LA7Y	W2NSZ K2OEA	W6LN W8VDI	IT1TAI VK3YL	W6SQP W6UQQ	• <b>192</b> W1DEP
W1FH W6AM		W3LOE	W7AH W7KTN		W3DKT	W8VDJ WØPNQ		W6UQQ W7FAW	W10JR
ZL2GX	• <b>265</b> W5JUF	W6CYV W6GPB	W8UPN	• <b>229</b> W1BLF	W3PGB W5ENE	EA2CA G2MI	• <b>202</b> W2IWC	$rac{ ext{W7RT}}{ ext{W8DUS}}$	W1ZZK W4PN
• <b>284</b> KV4AA	WØELA	W6LDD W6UHA	WØNTA G3DO	${f W3OCU} \ {f W6ALQ}$	W5FNA W5OGS	$\begin{array}{c} { m G6BS} \\ { m OZ7BG} \end{array}$	W3JKO W4RBQ	W8DX W8TJM	K4PTL K6EC
	• 264	W7ENW		W6GRL	W6AMA K6EVR	ZS2X	W5TIZ	W9ABB	W8HFE
• <b>282</b> W8HGW	W1JYH W2QHH	W7GXA W8SYC	• <b>239</b> W2CTO	$egin{array}{c} W6QJU \ W6ZCY \end{array}$	W6ID	• 210	${f W7DL} \\ {f W7QGF}$	W9BQE $W9MQK$	W9YNB DL6YK
PY2CK	W6NTR W8KML	$\begin{array}{c} W8WZ \\ W9FJB \end{array}$	CE3DZ	W9IU G3FKM	W9QIY I1AOF	W1BIL K2DLT	W7QGF W8ČQ W9KXK	W9UIĞ WØSYK	OZ3Y
• 281	4X4DK	WØDU	• 237	ZS6OW	KP4KD ZL2HP	W1LZE	W9SFR	CR6BX DL3RK	• <b>191</b> W1AEW
W3GHD	• 263	WØYXO G3HLS	W2CYS W4MR	• 228		W1TX W2AGO	CX1FY HB9MQ	G5RV	W3AYS
• <b>280</b> W8JIN	W6SAI W8JBI	OE1ER OK1MB	${f W5BZT} \ {f WØGKL}$	${f W6YMD} \\ {f W7ADS}$	• <b>219</b> W1VG	$egin{array}{c} W2DSB \ W2EMW \end{array}$	PY1HX SM3AKM	G6QB G8KS	$egin{array}{c} W4FVR \ K6EWL \end{array}$
G3AAM	W9FID G6ZO	• 249	• 236	W9WHM VE2WW	$\begin{array}{c} W2BBS \\ W2LAX \end{array}$	W2NUT W3MDE	- 201	I1AIV I1XK	W7GHB W8HMI
• 279		W5ABY WØQVZ PAØUN	$rac{ m W2QKS}{ m W6FOZ}$		W3GRF	W5DMR	W1FFO	I1ZFD KH6PM	W9KA
W2AGW W3JNN	• <b>262</b> W1BIH	PAØUN	W9YSX	• 227 W6KEV W8DHC	$\begin{array}{c} W5NW \\ W6YK \end{array}$	W5HDS W5JC	${_{ m W1RB}} \ {_{ m W2DKF}}$	ON4QF PAØGN	WØUQV CN8MI EI9Y
W5ASG W6SYG	W3JTC		• 235	W8DHC G3YF	PY1AJ	W5KBU W5KUJ	W2SUC W2TWC	SM5CO	F8PQ
W8BRA	• <b>261</b> W3EVW	W4LVV	W3CPV W6OME	4X4RE	• <b>218</b> K2BU	W6GMF W6JK	W3RNQ W3VOS	VE1PQ VE3AAZ	G3EMD
• 278	W4DQH	W4LZF W4QCW		• 226	W3MFW	W6MJB	W4BQY W4BYU	VE3DIF	I1KN KL7PI
W2BXA W3KT	${f W6SN} \ {f W6VE}$	W5MIS	• <b>234</b> W2GT	$ootnotesize W5LXY \\ SM5ARP$	${_{ m HB9ET}^{ m W5PZL}}$	$egin{array}{c} W6WWQ \ W7HIA \ W7HQC \end{array}$	K4CTU	$egin{array}{c} { m VE6VK} \\ { m YV5AE} \end{array}$	OQ5RA VE3AIU
$egin{array}{c} W8NBK \ G2PL \end{array}$	VK2ACX	• <b>247</b> W4EPA	W4AAU W5ALA	• 225	KP4CC	W7HQC W9EU	W5DGV K6AYA	ZL1BY ZS1BK	VO1DX
	• <b>260</b> W1GKK	SM5LL	• 233	W1KFV W8SDR	• <b>217</b> W1FZ	G5VT	K6ENL W6GMC	• 199	• <b>190</b> W1BGA
• <b>277</b> W6DZZ	W1TW W6VFR	• 246	W2BRV		W2CR	KZ5CP PY4IE	W6LRU	WIBFT	W1JNV
• 276	W6YY CE3AG	W7AC	K2BZT W3JTK	• <b>224</b> W2RWE	W2OKM CM9AA	VE3QD	W6PQT K6UYC	W1LOP W2IYO	W1MB W1NLM
W2HUQ W6CUQ	CE3AG VK2DI	• 245 W1TVO	W6DI F8BS	W4CYY W5MMK	ON4FQ	• <b>209</b> OK1HI	W7EJD W9FNR	W2LSX W3NKM W6EAY	W1QNC W2CWK
W6MX	• 259	W1TYQ W2KUW	• 232	W6KYG W8CED	• <b>216</b> W2AYJ	SM5WI VE7HC	W7HKT W9GDI	W6EAY W6ULS	W2EQS W2GUM
W9NDA W9YFV	W6MEK WØDAE	W4HA W8TMA	W5CKY	PY1GJ	W3EYF	• 208	W9JUV	W6ANN	W2IOP W2QJM
• 275		FA8IH	$egin{array}{c} W5GEL \ W6KZL \end{array}$	• 223	${f W6EHV} \\ {f W6KSM}$	W1ZL W4AIT	WØQGI WØUOX	W8IRN WØDXE	W2QJM W3HIX
W8BKP	• <b>258</b> W2WZ	• 244 W14DM	W6VSS W8CLR	W1MV K2GMO	G3FNN G8IG	W4AIT W7MGT	CN8JX CT3AN	VK2NS	W3SOH W6BUO
W8DMD	• 256	W1ADM W2LV	W8QJR W9QLH	W3FGB	ON4PA	DL7BA	DL1QT	• <b>198</b> W1EOB	W6CG
• 274 W1CLX	K2GFQ W3IYE	W5KC W6BVM	WØAZT	${_{ m W5FXN}} \ {_{ m W6WO}}$	TI2TG	• <b>207</b> W1ICP	${ m G6XL} \ { m KH6BA}$	W3ALX W6BYB	${f W6LTX} \\ {f W6OMC}$
W3BES W5ADZ	W9ABA	W8MPW W8UDR	G6YQ OK1FF	W7NKW W8PUD	• 215 W2YTH	W2AEB	LA5YE PY4AO	G8KP	W6UCX W7AUS
W9RBI	• 255	W9FDX	SM5KP	WØANF KV4BB	W7AJS	W2AQW PY1AHL	SM7QY ZL1AH	• 197	W7AUS W7BGH
G4CP ZL1HY	W5BGP WØAIW	• 243	• 231		W2YTH W7AJS W7ASG DL7AP	• 206		W1CH W2JB	W7IQI W8AJW
• 273	• 254	W8LKH	W2DEC W2PRN	• <b>222</b> W1IAS	• 214	W1AB W3GHS	• <b>200</b> W1BLO	PY4ZS	$egin{array}{c} W8CVU \ K9BVR \end{array}$
W1ME W4TM	W7PHO W9FKC	• <b>242</b> W1CWX	W2SAW W3ADZ	$\begin{array}{c} { m W2BOK} \\ { m W2BYP} \end{array}$	W2HSZ W4CFD	W4NNN W9LNM	W1WK W2ALO	• 196	W9DYG W9JIP
W4TO	WØNLY	W3CGS W3LMA	W3VKD W5UX	W2YW W3DPA	W5EB W6CAE	W9GIL	W2AZS W2FBS	W9TQL SM3BIZ	W9JIP CR6AI ET2AB
W6ADP W6ENV	• 253	W8KPL	W6EFR	W6CHV	PY1DH	WØBCI VE1EP	W2IRV	• 195	JA6AO
${_{ m W6GFE}} \ {_{ m W6TT}}$	W2HMJ W9AMU	$^{ m HB9EU}_{ m HB9X}$	W6NGA W6PH	W6PYH W8YIN	VE6NX	• 205	$\begin{array}{c} W2MUM \\ W2REF \end{array}$	W2ZVS W3AXT	KH6CD OK1CX
W7AMX	• 252	KH6IJ	W6QNA W6TXL	CO2BL DL7AH	• <b>213</b> W4DHZ	DL1BO	W2SSC W2TOR	W4TFB W5HJA	· OZ3FL VO6EP
• 271	W1AXA	• 241	W7HXG WØNUC	GM3EST	WØVBQ	• <b>204</b> W2GFW	W3FYS W3NCF	W6MEL	ZL4GA
${f W6EBG} \\ {f W6TS}$	W6LW W7FZA	W2JVU W3DRD	G4ZU	LU7CD ZS6FN	OH2RY	W2HHF	W3WU	DL1KB SM5KX	• 189
• 270	W8DAW W8EWS	${f W4BPD} \ {f W4KFC}$	• 230	• 221	• <b>212</b> W2HZY	W5NMA W6NJU W9VIN	W4AZK W4BRB W4IMI	VE8AW	W4GRP W4VYP
W7GUV W8KIA	DL7AA HB9J	W4LYV W4OM	W1HA $W2TQC$	W1ZW K4AIM	$W2UFT \\ W6MHB$	W9VIN LA3DB	W4IMI W4THZ	• <b>194</b> W1KXU W1LHZ	W4VYP W6SUQ W8OGV
W9HUZ	VE7ZM	W5FFW	W2TXB	W4FIJ	W8BTI		W5DML	WILHZ	JAlAA
${f LU6DJX} \ {f ZS6BW}$	• 251	W6TZD W9GRV	W2ZGB W4GXB W5AFX	W5EFC W6ZEN	EA3CY G3BKF	• 203 W2TE	W5LGS W6ATO	W7PGS HB9KB	PAØNU VS6AE
• 268	W1HX W2DS	VE7GI	W5BNO	W8NGO G3AAE	• 211	W3LMM W6SIA	W6BIL W6BUD	KH6LG	• 188
W6NNV W8UAS	W3KDP W5EGK	• 240 W2CNT	W5CEW	I1AMU ON4NC	$egin{array}{c} W2BJ \ W2HQL \ \end{array}$	W6TPJ W6LDJ	W6EPZ W6GAL	• <b>193</b> W5LGG	W2CWE W9IOD
	G6RH	W2CNT W3OP	W7FB W8EV		W3ALB	W6NHA	W6KEK	W9RKP	WØBFB
• <b>267</b> W3GAU	ON4AU	W4ML W5OLG	W8GLK W9KOK	• <b>220</b> W1ENE K2CPR	W3WGH K6CJQ	W8ACE W8CDT WØPGI	W6MVQ W6PB	EA4CR F3FA VE7YR	WØIEV FA8DA OZ7PH
W7GBW CN8MM	• <b>250</b> W2JT	$egin{array}{c} W6BZE \ W6CTL \end{array}$	W9UXO WøQDF	K2CPR W2GVZ	W6DBP W6KBC	WØPGI G3FXB	$egin{array}{c} W6RBQ \ W6RLP \end{array}$	$egin{array}{c}  ext{VE7YR} \  ext{ZS2AT} \end{array}$	OZ7PH VQ2DT

104 QST for

• 187 W3ZAO W5CFG W9AND F9RM W8DLZ W9RQM WØEYR WØTKX CX1BZ DL1GU • 150 W1JOJ W1AWI W2AXR W2BUY W2CGJ W5MY W6LV W7VMP W8CKX W9PVA W9TGY • 155 W6ITH K6IYJ W8MFB • 172 W1ICW W3JNM **I1AY** SM3EP SM5CCE YV5AK GM5RH HB9MX 138 K5ALA W6FSJ 167 W4TP W8WFB WØAIH HB9FU ZL3GU WØCDP DL9TJ TIUA G5CG OZ8SS PAØFAB SM5AQW 160 W1JDE W1LQ W1PFA W1QMM W2ADP W2FXA W2GUR KR6AC F8EJ DL4ZC G2AJE G6RB OH2OJ G2EC W1IJB W1NHJ W5CE VE7JB G3ABG G6GN PY2BAU SM7AKG OZ5KQ OK1JTI ON4JW G3DCU HB9QU W2GVP W2PJM VE5JV TA3GVU VE2WA ZL3AB ZL3LR • 154 · 186 K4BVQ W5AWT W9WFS W5QVZ W6PCS W7DJY WØDMA W1ZD W2QCP W3EOB W3KJJ • 145 PAØVB PY7LJ VE3IJ W3AZG VE3JZ VE7VC VE7VO W2BMK • 140 W1CKU W1FVF W1JMT W2CKY W3CPB W2PXR W3EEB W3FMC W3GRS W2ICO W2OGE W1JTD W6OF VK4FJ W6KG W7AQB CN8GU CR5SP F9DW OH3RA YV5BZ - 171 G4TM W2OTC W3KVB W8AYS W1HRI W1PKW W1RAN W2ESO W4AIX W4JAT W8ZJM W3IXN W3LVJ W3MZE ON4KT W3ARK W1MIJ W1MIJ W1QXQ W1RWS W1VAN K2CF W2JVZ W2OCI W2OMS W1RY W1WY W8LAV WØBPA W3KFQ W4GHP W4NWW W4UKA W4WM GM3BCL PY3QX VE2YU • 179 VS6CG W2CSO W2GWE EA2CR W3RBW 165 W4FID W4FYI K4GEZ W4HKJ G3GFG W3KZQ W2LJR W3LBG G3BNC JA2KG PAØNOL W2PWP W2RGV W4AAW W4DKA W4GJW W6PZ WØYCR W5ACL W9ERU G3CSL KP4JE • **136** W4IUO W4JZQ CP5EK CT1JS PAGTAU G2BXP W5MCO OY7ML W4PVD W4TAJ W4YK K5BGT OE3WB ON4DM ZL4BO G6VQ GM3ČIX W6KJR VP9G W2PDB W6LVN W6OUN W6QDE W6YMH W7DET W5TPC W6DUB W8FJN W9ZPT W2VYX W1FTJ W1OTX • 178 W1AUR W2COK W6NIF/4 W2ZA CR9AH YU1AG 153 WIGDY · 164 W2ZY G3AH W2SHC W1QF W2GTP G3RB W8UMR WIDX W5CEC W3DYU 184 W4VCB/3 W1FTX W7FBD W7GUI W9ROU W9UZS WØCPM W2AOX W5DA W3EQK KH6PY W6AGO W5LHP G2WW W2HO W3ZQ W8OCA W3RSR W6WTH W5UUK W6CGQ W8NJC W3ILA VE7AIH DL1BS W8WT W8YHO W3WPG EA9AP W9MXX VK3BZ GI4RY W7KVU W6DE W9HQF W9NZZ W9QNO WØMLY W8AJH W8WWU W9WKU W4IEH W4IWO W4IZR OH2QQ SM3AKW W1AF W1BAV W9BBU W6EAK G4QD PY1ANR 3V8AB • 177 W2RDK W4CYU W6GSL W6MJP SM5WJ G5LP ON4AZ VE1HG VE7SB W1ELR WØLBB W6PBI K4JOU W3LXE 183 K4LNM W8BOJ CT1FY JA1CR W2UVE W3IMV ZSIRM F9IL G2AJB G2FSR W6RAN K4JVE W4YGZ K5DGI WØNGF • 143 W4DCW W1CUX W2BUI W6VX W7KWO W7WH WØQBA CE3AE W1JSS W3HEC W6ZY WØCKC • 163 W1ORP K4LPW W5GNG K2LWR W2NOY G3CBN CR7AF W4EEO W5IGJ F8SK DL9PX KG4AF W2BXY G6GH DL1ZN W8FPR W4EO G3FKH W5TTB W5VNL W2QKJ W2GDX GM6MD DL7FW W8JSU W6ZMX G500 KZ5WZ VE2NV • 176 W2AYU W3QJV W4ECI W3AFU W3DBX W3JZY W3RPG I1CJW KH6WW HB9NT OH2NB W8KZT W7BE W9PQA W9PSR G6XA W8PCS W6CTO OH3RS W3EBG KP4YT OZ5PA VE3ZW W8PXP W6DQH K5ADQ PAØDA SM5BRO W3GEN OE1FF W9CIA WØAGO W9WHY W6FZL W1BGW W2DOD W2IWM W3LVF W3MDO W3MJF W4JDR OH2TM ON4GC W7ACD W7HJC WØERI VE6KX WØDSP SM5PA K5ABW WØDST WØYPQ WØVBK HB9MU OX4GC OZ7SN PY4AJD SM5BCE SM6HU W6BJU W6CYI W8MWL CR7BC DLIFI W7NRB • 152 W1APA W1AW W1MUN W2GSN W8CXN W8FJL W9PNE ON4GU VE5RU K4EJO EA4BH DL3SZ W1APU W4JII G2VD G3AKU EA3GF F3MS W3WDC W1YPK W4SRT W4VE W3AOH W4NBV W4NNH W5MET W8VLK W9AEH ZL1AJU ZS1OU VK3XO G3GIQ WØAJU W3HUS CE3HL PAØHP W6CIS ZS6KK W2MYY G6VC G3HCL WØBSK W3WSF W6FHR W6KUT • 159 G8KU HB9IM WØGKS W3KBC W6SRU W3HER W3KDF • 162 W2GTL # W2OST G8PL HK3CK I1BDV LU3DH NY4CM VE1NH WØOAQ K6LGF W6MUF W4CYC HB9CX VK5RX W6JZP W5CPI KH6AYG WØOJW W6TKX W6UOV W4AIS W6LMZ WØOUH W5DXW 175 W1ZDP K2PIC W3NA W3NOH K6EDE W6FLT W9PIO W4JFE W9EHW I1FO DL1HA • 142 W1TS W2MLO W3KQF W3RUT W4UXI W6SWG W6VDG W9LI W7WVE W8AE W8DEN W6ETJ W6VOE WØDGH DL3BK KH6MI W1NW W10OS W3ZAL W4HQN W5LVD DL3TJ DL7EN EA5BD G4FN G8UG KP4WN F8VK KØDMY DL1LH EI5F OH1ST ON4HB OZ7EU SM5CXF SM5KV SM6VY G6LX GW3ZV F9AH G5JU FQ8AP G2AKQ G5YV G2AJ W6BAM K9AGB G5VQ GI3IVJ OH1TQ W9WYB W9ALI HB9AO **IIIR** KT1EXO OK1VW SM3ARE DJ2AE G3AIM W9FVU W9VP JA1CJ KL7PIV PAØRLF W8IB W8LY W9AHP W9WJH LA2B ON4MS SM6ID OH6RC G80N KH6QH WØFNN VE3IR **HBLF** OZ7KV IIVS KP4ADX PAØLR PAØVO VK4EL ZC4XP ZL3GQ DL1DX LU5AQ VQ4KRL WØRBA VK6SA VQ2GW PAØGT SM7MS SM7TQ VE3ADV DL1YA EA1BC SMBACO DL3FM ZL3CC W9ZRG VU2JP DL6MK ZS2AG • 158 WØIDI W7QON WØĞDH G6RC ZE2JN GM3CSM • 174 4X4BX EI4Q G4JŽ • 149 W1ATE W1BOD LA6U PY1ADA HP1BR VK5QR VE1EX W2UEI IS1AHK KZ5DG VE2YA VE5QZ ZS6.1Z 161 PY5UG G8GB • **151** W1KQF W2BBV K4HXF PY7VG SM5ARL TG9AD W1IKE W1JEL ZS6LW W1DSF W1NI KZ5IP VE1EK VP5FR W4OPM W6OBH ZL1QW ZL4ČK PAØZL 157 W1QPN W1NS K2AAA W2ITD W4JXM W6NIG W8VTF W9PGW PY2NX PY7WS VE7MD • 133 W1CJK W1KWD W2FXE W5RIO K2BSM W2PZI W8ILG ZS2CR ZS3K 9S4AX W3FLH VR2BZ W2RA W3AFW W4COC W5CGC W8JXY W8RDZ ZS5CU PAØIF 4X4CJ • 180 W9TJ ZS6A ZL2QM 4S7NX W1DQH W1JMI ZS6OV K2EDI DJ2BW W4CKB W5VGR 141 W1AZY W1EFQ W2GNQ W2KMZ W3MQC EI4X F8LF KH6VP MF2AA ON4FL W6GHU W8HUD • 139 W2EGG W3FUF W2AW K2GNC W2MEL WIODW • 169 W6WKU W8ONA K9EAB • 148 W1EIO W3BYI K2ERC W2FJH W8EKK W8EYE W8TUO W2ABM W2IMU K2JYH WØTJ W9OTS W4PHJ W4BFR G3IDC OH3NY PAØFX PY4RJ K6CU W8ZZU W9MZP W2PUD W9UX W5LCI W6CLS W4QT W5KTD W6APH K6QXF W7PEY DL3DP W3AS W9WIO W8BWC W9BYN W3LEZ W3LPF W3MLW • 173 W1WLW W2DEW W9NN WØGUV EA1AB EA2CB G2IO DU7SV G2BVN W8ERA FA9RW DLIEE GW3FSP W7AYJ EA3KB W8LQA W9CYT W9CYU G8RC DL7CW LA5Q VP7NM W4HVQ W4HYW F3AT F8PM W2MZB G2YS • 156 W7SFA HB9CE W2SAI K4PDV W4LQN W6FUF **GM3AVA** KP4WD OH2LA WSESR W9MPX W4JBQ W5VIR HB9DO HB9KU W8ZCK G3AJP • 147 G3AWP G5FA G6QX LA5S W8PWH W6BSY ON4TA PY2AJ W9TGT W1AH W8DFQ W6NZ W8PHZ WØLLN I1CZE WØCU EA7CP G2FYT W6EAE W6EYR W9TKU 168 IS1FIC KV4AQ OK1LM SM5DZ WØEWH G3COJ W2OBX VE3HB WØJFI W6PLK W6RM I1ALU I1IT W2ROM W2UWD VK3JE YV5FK G3LP OZ7CC PY7AN CX4CZ OQ5LL PAØLOU W3RCQ W5LV F8WK JA6AD ON4TX G5LH G5SR. W7DAA W6IPH PAØRC ZS6EU ZL3BJ

GM3CMB KL7MF MP4BBE CM3CMB KL7MF MP4BBE CM4BBE OD5LX PAØHJK PY7VB   *132 ********************************	K4HRG W4IYT W4JUJ W4OSU W5CDP W5OEN K6GXG W6LER W6OMS W6OXS W6WIX W7RFE W8HEV W8YCP W9EXY W10 G2BQC G3FS G3GNM G3IFB G3FW HB90A HILT HUB HZQ JASAA KH6ER KZ5KA OH4NF SM5OW ST2AR VE3BHS VE3BHS VE3BHS VE3DKY VE3SR VE3TB VF7NS VE3BHS VF7NS VF3BHS VF3BH	W5RHW W6MI W6YX W9FKH CR6AU EG6AU EG6AP 11BNU KV4BK ZL2AHA ZS1FD •126 W1AZW WBDS W3MWC W6CBE W6RDR W7AHX W6CJE W6RDR W7AHX W6DJE/9 W6MKF W6PDN DL3TG EA3CK E13R FF8AG HB9DB HB9HZ VE3EU VP6CDI ZC1CL ZE3JP •125 W1AWE W1MTG W2BLS W1MTG W2BLS W1MTG W2BLS W1FY W1FP W4SIB W4Y1HQ W5CBE W4SIB W4Y1HQ W5CBE W4SIB W4Y1HQ W5CBGF VK3PG •124 K2JFV W3RBF W4FNS W6CEO W6KYT W8RSW CE7AA DLIJW DJ3KR G3GQS G3GSZ G5VU OK1SK OK2AG PAØXE SM5AHK SM5XP ZS6BJ •123 W1GKJ W1YRO W2NIN K2PKT W4JTB W6JQQ U25GH W4JTB W4	**TITE	W2EQD W2OXR W2WPJ W3AOO W3CDG W3DDV W3MNO W3QLW W4DPE W4EJH W5URU W6CZB K6OWQ W7YOA W8SWG W8TTN K9CUY W9DCA W8FTN K9CUY W9DCA W8PJSV W9DLSV W6DLSV W6DLS W	*118 **W9GFF** W9VAG** W1200**	•114 WIBBN WILUU K2DSV K2HYN W6MPY W6MPY W6MPY W6MPY W6MPY W6MPY W9ELA W9LVR W9LVR W9LVR W9LVR W9LVR IILD DLIFE DL7BK IILD IIWP KH6RR LA4DD OHIPW PY6BN SP5KAB VE2BR VE3RC VU2RA ZE5JE ZS6HO •113 WIPEG W1YXD K2OLS W2TUD W3HDZ W6CHL W6WPI W9QLD W3HDZ W6CHL W6WIPI W9QLD W3HDZ W7LVR W9QLD W1LD W1LD W1LD W1LD W1LD W1LD W1LD W1	SL5AX SM5LN TC99AZ UR2AK VE3XY VE3XY VE6JY ZS6WJ 4X4CR  •111 W1AWX W1CDX W1LVQ W2IVS W2ETU W2MA W2PTD W2UAT W3HHK W3HUV W3MQY W3MQY W3MQY W3MUH W3ZN W4BBR K4GOZ W4LIM K4GOZ W4LIM K4GOZ W4LIM W5CRK W6GBG W7PSO W8GFH W8YPH W8FTO W9DUR K9COS W9DFV W9HUV W9HUV W9BMM W6CAW W9DFV W9HUV W9BMM W6CTU K9CXR W9QPL W9SBE W9ZVJ CR7IZ CT1CF CT1GE DJ1XW DL3AO DL3BL DL3BL DL3BL DL3BL DL3BL DL3BL DL4UZ DL7AQ EA3KI F3SM G2FFO G2IM G3CEG G3FPK G4AR G4AR G4AV HB9MC HP1LA HB9MC HP1LA HB9F LA1K OH2KP OH4NT PAØRL PY2AK SM2APH VSEAPH VSEA	W2HAZ W2MOF K2QXG K2SHZ W2WDP W3GJY W3IPO W3NQC W3TBP W3VZD W3NQC W3TBP W3VZD W4EXO K4IGS W4EXO K4IGS W4EXO K4IGS W4EXO K5WF W5WF W5WF W5WF W5WF W5WF W5WF W5WF	UC2AA VE5TK YV5FL ZSIM ZS6SG 4X4FV  •109 WIRCQ WIZFV W2RUJJ K4KOR W4VB W4ZMC W7GJ W7MCT W7OCL W6MCF/C1 C06AJ D16IC EISC EA3FL ET2US F3DA F58W F9ER F3DA F58W F9ER F3DA F68CF G2DHR G3AMM G3GGS G3GS G3GS G3GB G3BH HB9BN HB9EI HB9BN HB9EI HB9BN HB9EI HB9BN HB9EI HB9KO HJ1AB KH6BLX LUSEN PAØPN PY1FT PY1RW VE4DB VE7AHG VS1DZ VV5BS W1EZ W2BOT W5TDZ W2DKS W4GCW W4LHT W4RNP W5GAH W5TJ K6GJS W6PUZ W8DT W4RNP W5GAH W5TJ K6GJS W9PLT W7MQY W8LHT W4RNP W5GAH W5TJ K6GJS W6PUZ W8DT W7MQY W8LHT W7M
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OH5PE OK2DD DL1TM OK2DD DL1TM OK2DD DL1TK PAØOK DL1UE SM5KB DL2HI SP3DG DL2LK SU1XZ DJ3BB VE6GD DL3IE X2ZTH F3IM YU1AA F8BQ ZD6BX F9EP ZD9AA F9FS ZL1LZ F9JZ F9RS AV1DDO G2HFO W1KLY G2ZF W1PDF G3BHW W2HIQ G3BYM W2HIQ G3BYM W2HIQ G3BYM W2HIQ G3BYM W2HIQ G3BYM W3LBL G3CMT K2RNN G3DDK W3BYZ G3GMG W3DJZ G3ETU W3EPZ G3GWO W3KVQ G3HIW W3YPI G3QD W4BTU G8TD W5BJA G13JIM W50VE HB9BJ W6CUL HB9CS W6ERB 11AEG W6ENB 11AMO W6PWR 11RY W7HNY JA2DN W8BNA KA2AL W8DDK KH6DQ W6YTL OH2HK CTICB OH3OE DL1FK OH5OE DL1SO OH7OL DL3UE OK1CG F9RO OK1JQ F57RT OK3SP G3CSP ON4HX C2KU OZ3RO G8IP SM2SCS G8QZ SM5AJR W9GNU OA4ED DL1FK OH5OE DL1SO OH7OL DL3UE OK1CG F9RO OK1JQ F57RT OK3SP G3CSP ON4HX G2KU OZ3RO G8IP SM2CS G8GZ SM5AJR H89HH SM5DX H89PM SM5TQ JA1DO SM5UH JA3AA SM6DN KH6YL SM7AUO OH2RW VESAHV OH3RY VK3CN OH4RY	W8AQ W4AWS W8QZB W4CQI W8ZPX W4DME W8ZPX W4DME W8ZPX W4DME W8ZPX W4DME W8ZPX W4DME W8ZPX W4DME W4SYE W4DME W4SYE W4DME W4FNQ W4FPR W5DY W4JYL W6FID W4KYI W6VFT W5JSR CT1ER W50FM DL18D W5TOU DL3FL W6DYP DL3FL W6DYP CFEL G3GYH W6MUC G3HLY W6MYC G3HD W7GWI G3JEQ W7KEM G4BWBWS G6CB W8DVA G6CB W8DVA G6GB W8DVA G6GB W8DVA G6GB W8DVA W8ELB G13AXI W9EHU H89BZ W9FJY H89PV W9GA HRIAT W9HCR H71KE W9KYK JA7AD W9TKR M3ZJ W9UXS OEIWH W9BAF OE2SP W0DAO OE3VP W0DSO OH1OY W0GNG OH2IK W9GXI OH3NA W9GYL OH3PB K0TFF OH3UO WJJY OH6NZ W0SQO OK2OS DL1FL OK2SF DL1PV OK3EA DL1SF ON4TU ON4TQ DL4HH PAØALO DL9VR P0HJY FE8AE P1AH G2CLL SM1AWW G2FQP P1MK F77ZA DL1RD C6FB W6GNG OK1OP W12FB W13FB W6GNG G3JHZ VE3IG G3FJ VE3IG W2CL S4SEP VE3AA G3CQF VE3IG G3FJ VE3BA G3CQF VE3IG G3FJ VE3BA G3CQF VE3IG W2CL S4SEP VE3AA G3CQF VE3IG G3FJ VE3BA G3GCP VE3IG G3FJ VE3BA G3CQF VE3IG VE3BA VE3CD V	WIALK WIIAP WINF WIQXX WITKC WIUMC KEBJA W2BPA W2BPA W2BPA W2BPA W2BYA W2BYA W2BYA W2PIN W2UPH W2WFC W3EIV W3EIV W4FZO W6GHG W6JWL W6MLY W6MLY W6MLY W6MLY W6MLY W6WB W6YRA W6YRA W6YRA W6YRA W6YZC W7AEA W7DXZ K7FAE W7GEB W7TJP W7TPE W7	0H2LX 0H30D 0H30D 0H30D 0H5NK 0H50U 0H5NK 0H50U 0H60A 0K1LM 0K1NC 0K1LM 0K1NC 0K1VA 0K1NC 0K1VA	W6TGH W6TMX W7AGS W7IVH W7WZW W8AAP W8AVB W8EZEI W8HZR W8LYQ W8FAU W8JRB W8KBT W8LYQ W9FAU W9GMZ W9HYM W9ULIL W9NXU W9GMZ W9HYM W9ULIL W9NXU W9FAU W9FAU W9FAU D11L W9RMH W9ULIL W9NXU W9RMH W9ULIL W9NXU W9RMH W9ULIL W9NXU W9RMH W9ULIL U9NXU U9HYM W9LIL U9NXU U9HYM U9H U9HYM U9HYM U9H U9HYM U9HYM U9H U9HYM U9H U9HYM U9HYM U9HYM U9HYM U9HYM U9H U9HYM U9H U9HYM U9H U9HYM U9H U9H U9H U9HYM U9H	OK2MA OK3AL OK3AL OK3AL OK3AL OK3AL OK3MM ON4MN OO2KK OZ2LX PA98U PA98U PA98U PA98U SI3AG SM3FY SM7AAZ SM7AAZ SM7AAZ SM7AAZ SM7AAZ SM7AAZ SM7AAZ SM7AAZ SM7ABDN VEIBV VE3BUR VE3QE VE3RM VE6FK VE7OJ VK2YC VK2ZH VK2ZH VK3S  VF9BM VQ4KPB VK2CC Y13BZL ZL3CP ZL4DV ZS2FH ZS3S ZS6VR 4X4CZ  •101 W1FPS W1GFH W1GYZ W1FPS W1GFH W1GYZ W1FPS W1GFH W1GYZ W1FNA W1WYY W1NAV	W5IIP W5QF W6AYZ K6DCE K6DDO W6JFZ W6HOH W6JDO W6JFZ W6HOH W6JDO W6JFZ W6KIQ W6KIQ W6KIQ W6KIQ W6KIQ W6KTW K6LZI W6MUM W6POZ W6QWV W6RCC K6RWO W6SC W6TBP W6TEU W6TEU W6TEU W7FAA W7CFA W7	G3EEB G3GAF G3HEP G4GI G4GJ G4LP G5RM G6XY G8CD G8NV G8TS GM2TW GM3GJB GW4CX H89BX H89EW HP1EH HP1EH HP1EH HP1EH HP1EH LA60 LU5AFL C053ED OE5PV OE3ED OE5PV OE3ED OE5PV OE3FK OH1PI OH2I OH2V OH5OT ON4RM OZ1W OZ4FF PAØFD PAØMOT
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W2KGN	K4BAI	W5DRI	W6WLI	W8WOA	WøWHW	EI8S	G5JL	LA5R	VE1EA
W2KTF	K4BFN	W5EGD	W6ZTW	W8ZIY	CE6AB	EI9Q	G5WC	MP4QAL	VE1GJ
	K4CLT	W5FTP	W6ZZ	W9AMM	CN8BP	F3II	G6AX	OA4AK	VEINE
W2LRW		W5IX	W7FMX	W9BEM	CO2BM	F3TX	G8JO	OEIGZ	VEIYB
K2MPB	W4CRI			W9CAS	CR9AF	F3ZÜ	G8JR	OE1KF	VE2AFC
W2OQO	K4DAS	W5JLU	W7IAA		CR7CI	F7BO	G8LG	OE1TA	VE2KZ
K2PFC	W4GMR	W5KCR	W7IEE	K9DNR					
W2PGU	W4IA	W5KJN	W7JUO	W9ESD	CT1FM	F7DB	G8UK	OE3AS	VE3ARS
W2SGK	W4KCQ	W5NTT	W7KEV	W9FBI	CT1PJ	F7ER	GC2AWT	OE3SE	VE3BMB
W2TJK	W4KIT	W5NXF	W7LYU	W9FYM	CT3AV	F8PI	GI3BKG	OE5LV	VE3OR
W2UA	W4KMS	W5QKZ	W7ONG	W9IWX	DL1AG	F9OQ	GI4NU	OE8KI	VE3QB
W2VCZ	W4KN	W5QLY	W7VIU	W9IZ	DJ1BZ	FG7XA	GM3EDU	OE8SH	VE5VL
W2ZQW	W4KRR	W5VAE	W7ZOH	W9JNB	DL1DC	G2AO	GM3EFS	OH1TM	VE7AAD
W3AFM	W4LZW	W5ZSX	K8AEK	W9LNQ	DL1IP	G2AOW	GM8AT	OH2VN	VE7CN
W3EH	K40BM	K6AQP	W8AL	W9OMŽ	DL1VR	G2BJY	GW5FN	OH2WM	VE7EH
W3ETD	W4POF	W6BUY	K8CFB	W9POC	DJ1VS	G2GM	GW8UH	OH3SO	VE7ZK
W3EWR	W4PRO	W6CGP	W8FJR	W9PWM	DL1YY	G2NS	HA5AM	OK1GT	VK3RJ
W3FJU	W4RKB	K6CHR	W8HSW	W9QLW	DM2ACM	- G2ZZ	HB9DH	OK1WF	VP2LU
W3HA	W4RTX	W6CUF	WSICC	W9SZR	DJ2BC	G3AAG	HB9DK	ОКЗНМ	VQ4BU
W3HQU	W4SHJ	K6DSK	W8IQS	W9TPA	DL3CM	G3ACC	HB9EC	ON4CY	VQ4HJP
W3JAK	W4SNR	W6DUC	WSIV	W9UAZ	DL3KN	G3BDS	HB9TE	OZ4KX	VS1FK
	W4SOV	K6EIE	WSJGU	W9VOD	DL3LB	G3BNE	HC2KJ	OZ4PA	VS6BA
W3JLJ	W4UDZ	W6EKC	W8JM	WØARH	DL3NX	G3CWW	HC7KD	PAØBK	YO2BU
W3KA		W6GHM	W8LCN	WØBFY	DL300	G3CWZ	I1PL	PAØBX	YSiO
W3KQD	W4UHC	K6GSL	W8LFJ	WØBMQ.	DL3RM	G3FPI	ÎT1ZGY	PAØHG	ZB1CR
W3OHC	W4WW	K6HFB	W8LYP	WØDRG	DL4MW	G3GZJ	KH6AUJ	PAØUV	ZL1ACO
W3ORU	W4YMG	W6KXG	W8MFW	WØFFV	DL4M W	G3HCV	KH6SO	PK4KS	ZL2AFZ
W3SJK	W4YSD						KL7PJ	SM3ACP	ZL2FI
W3UVT	K5AHZ	K6OPI	W8NKU	WØFWW	DL6TW	G3HYM			
W3VQZ	W5BK	W6PYE	W80PG	WØFXI	DL7DA	G3IAD	KL7UM	SM5BPJ	ZS6AJO
W3VTH	W5CD	K6TXA	W8QQH	WØLJW	EA2BL	G3KGV	KP4ABD	SM5IZ	ZS6DG
W3WBD	K5CAO	W6UED	W8QVU	WØLBS	EA9DF	G3TC	KZ5GF	SM7IA	ZS5KF
W3YZI		W6UYW	W8SSI				LA1RD	SP1JF	ZS6IH
W4AFS	W5CTM	W6VBY	W8VVD	WøTXW	EAØAB	G3VW	LA2MA	SP5AR	ZS6OW
W4AMC	K5DBK	W6VZG	W8VZ	WøUCG	EI3S	G5CR	LA5DB	TF3AR	4X4DR

#### - RADIOTELEPHONE -

• 282 PY2CK	• 234 W1NWO	CT1PK	• <b>202</b> W1PST	WØVSK DL31R	OD5AB ON4DH	W2HTI W3HIX	F8PQ G5RV	CX3BH DL6VM	• <b>149</b> W8JXM
		• 215	W2APU	F9HF	PY2JU	W4AAW	IICAR	ON4RC	EI2W
• 275	• 233 W1JCX	K4AIM PY4CB	W2PUN W4ANE	YV5EC	PY4VX SM3BIZ	W6QOG W7MBX	• 161	VE2WW	I1AIM TI2OE
W8GZ	WØAIW	XE1AC	W4ESP	• 189	TG9AD	W7MBA W9HB	W1ENE	• 154	1120E
• 272	G3HLS		W7PHO	W4JG0		WØHX	W5GNG	PY7YS	• 148
W1FH	• 230	• <b>214</b> W3KT	• 200	W7ADS CT1CL	• <b>179</b> W4NHF	WØNCG CN2WX	W5MMK F3DJ	SM5WJ	W2LV
VQ4ERR	W8QJR	W5EFC	W4NYN	CITCL	IIAOF	F8LE	F8XP	• 153	• 147
• 269	W8UAS	G3DO	W9FDX	• 188	• 178	G3AIZ	G2ZB	W4VYP	W3BVL
ZS6BW	I1SM	ZS6DW	LA5YE PY1NC	W4AZD W5TIZ	W3VKD	HB9LA OZ7FG	I1ASM I1BIC	W6ZEN WØBFB	W4DOU WØFUH
• 268	• 228	• 213	PY4TK	W7MGT	ON4DM		ĨiŸĴ	G2MI	
W3JNN	W2BXA W6DI	CO2BK PY4KL	VE3QA	W8CLR	• 177	• 169	• 160	I1AHW	• 146
• 267	W9WHM		ZL1KG 9K2AZ	• 187	W4TFB	W2AEB W5PQA	W2FXE	VP9G	W6FHR I1ZCT
W8HGW	• 227	• 212		CX2AX	W8AJW	W6AED	W4CFD	• 152	
	W8DMD	W3ECR W6IBD	• 199	G6BS	G6RH	W8NGO WøIEV	W5ALB W5KC	W1LSZ	• 145 W1FPH
• <b>266</b> W8BF			HB9J YV5AB	• 186	• 176	ON4SZ	W7EMP	W2YYL W4CWV	W1LLF
WODI	• <b>226</b> W4HA	• <b>211</b> W8VDJ	I VOAD	G8IG	W1FFO W9ROQ	TI2LA	W8BGU	W5ERY	W1QGJ
• 261		WØGKL	• 198	T12TG	HC2JR	• 168	W8MWL W8NXF	W6SHW	W4GRP W6CLS
W9RBI CN8MM	• <b>225</b> TI2RC	HC1FG	W8JBI	• 185	• 175	W1AUR	W8WZ	W8AJH W8HBI	W9JUV
CHOMIN		ZP5CF	• 197	W5HJA	W2ZX	DL7BA	WØEHF	THRW	DL3EA
• 260	• 224	• 210	W3BES	• 184	W3GHS	• 167	DL1LH DL4BY	IICQD PY1ÅGP	G3BNC G8UG
W6AM CX2CO	W3GHD W6GVM	W2AFQ W2PTE	W4TO	W1BLF	CE3DY LU8CW	W3EVW	G6AY	PY3AGR	SM5ARL
ZLIHY		W5KBU	• 196	W3UIP	OZ3Y	WØCPM KZ5DG	LU4DD ON4PJ		• 144
• 259	• 223 VE3KF	W7HIA	W1ADM W4DCR	PAØNU PY4ZS	PK4DA	ZS5JM	ON4YI	• <b>151</b> W1HKK	W2RGV
W8KML	VESKE	EA2CA	W9JJF	F 1 446	• 174	• 166	VE3BDB	WIJXM	W6TZD W8LAV
	• 222	• 208	SM5LL	• 183	WIATE	W1FZ	• 159	W2QF	G3COJ
• <b>258</b> ZL2GX	W5JUF	W9YSX	• 194	W6CHV W8ZOK	W3LOE WøJYW	W5DMR	WØGEK	W6ČHY W7HXG	HB9NT
	• 221	• 207	W2WZ	W9YFV	CE3HL	W6OBH	I1CTE	W8EMZ	HK4DF OK1MB
	SM5KP	W6KQY	PY4PI	F8CW	ZP5ET	• 165	• 158	W8NWO	
W9NDA 4X4DK	• 220	W7HTB KV4BB	• 193	VQ2DT ZS1DO	• 173	W1MMV W8PWH	W2CKY	W8ZET WØIOS	• 143
	W1MCW	PY2AHS	W4OM		CR6BX		WØKOK WØSYK	VK2JZ	W9BEK EA3KB
• 253	W6SYG	ZS6FN	402	• <b>182</b> W2JT	CX3AA	• <b>164</b> W2AOX		ZS3G	PY1FR
G2PL	W9RNX G4ZU	• 206	• <b>192</b> W5ALA	W 23 1	• 172	W2EOH	• <b>157</b> W4CYU	• 150	• 142
• 250	SM5ARP	W5ASG	W5GXP	• 181	W4EWY	KL7AFR	EA2CB	W2PBI	W1BEQ
W6YY	• 219	W6MBD	PY1AQT	W9RRX VE3AIU	LA7Y	• 163	G3FXB	W2VWN W3BET	W1GKK W3KVB
• 242	CO2BL	• 204	• 191	VESAIU	• 171	W3IMV	• 156	W4GMA	W5KUJ
W8BKP	TI2HP	W1CLX	W3AEV	• 180	W1LMB	K4BVQ	W1QPN	W7AUS	W7HQC
• 241	ZS6Q	W9BVX W9QLH	W4MKB W5NMA	W1EKU W1GOU	W3NA G3BID	W8SDR W9HP	W6TXL PY4RJ	W8MRC W8PUD	DL7AA I1BDV
EA2CQ	• 217	G5VT	HB9ET	W2JY	PY7VG	G2BXP	VE5RU	W8TMA	PAØJA
240	IIAMU	202	100	W3FGB	VS2DQ	LU4MG	• 155	CT1MB CM2AVA	
• <b>240</b> KH6OR	LU4DMG VE7ZM	• <b>203</b> W4DQH	• <b>190</b> W1MB	W3MAC W4ADY	• 170	ZP5EC	• 155 K2AAA	GM3AVA HB9NU	• <b>141</b> W2BYP
		W8EWB	W4EEE	W5VU	W1HX	• 162	W3CGS	IIRC	W2UTH
• 239	• <b>216</b> W3DHM	W8JIN G3FNN	W5YLL W6SAI	CE3AB F9RM	W2BQM K2CJN	W2JIL W8IUA	W6ITH W8REU	PY4LP VE7AIH	W4FBH W4SKO
W5BGP	WabuM	COLIVIA	WOONT	ranni	MZCJN	WOLUM	MONEU	VE/AIII	OAGEN

## ## ## ## ## ## ## ## ## ## ## ## ##
W7PEY W8END W910D Z51KW  •131 W22W W910D Z51KW  •131 W22W W3NKM W4BWP W9BAE W9UUN F58K GM2DBX H89FU  •130 W1PNR W1VAN W2DEC W2NHZ W3BUX W3BYL W4BA W4EFX W4E
•123 W2MFS W8AUP W8IOO W9DSP W8IOO W9DSP W9TJ FPPH HB9JW KG6AGO •122 W1HRI W3GEN W5HFQ W7KT WØJRY WØUYC EA31X G2ALN 11TBU 11ZV LU5DC OQ5LL VE1NH VE7VO •121 W2TEX W3MDE W4BOC W4DWN W4HKJ W3HKJ W4JCK W4WSJ W4YHC K6TXR W9ABA W9ICL W9IHN W9JLH W9NLP CX1AK G4JW W1HBJC OH2SE PAØZD VE5GF VK5LC VK7RX VR2BC VS2DB YV5ABD ZP5CG •120 W1KRS W1PMZ W1UWB YV5ABD W1UWB W1UWB W1WB W1WB W1WB W1WB W1WB W1
W5JBD W7DAM W8CUO I18GZ LU3DH LU3PF PY7VE VK3BZ VP5FR 5A1TA  •118 W1AUF W1RYJ W2VQM W2VYH W6Y1 W9TJ JA6HK OD5AD  •117 W3JZY W3RUT W4KAE W6WTH W6YY W37LY W3RUT W4KAE W6WTH K6YI W6WTH K6YI W6WTH K6YI W6WTH K6YI W6WTH K6YI W1ALE W6WTH K6YI W1ALE W6WTH W7WTH W7W
W2IUV W3UMU W4IYC W4KGR W4KRA W7EKA W9BVM DL6PC G4JZ I1PDN OQ5FH OZ5KP ZS6LW  •111 W1JYH W1LIIB W2PRF W3OGR W5YKK W6BSY W7MBW W9CZC W9JZU W9UZC W9UZC W9UZC W9UZC W9UZC W9UZC W9UZC W9UZC W9UZC W1BAF IIBT IIBT IIBT IIBT IIBWN PAØTV PY1ANU VE3AAZ VE3TW V1UQW W1UQW W1UQW W1UQW W1WQC W2CGP W2GX K2QQQ WW1UQW W1WQC W2CGP W2GX K2QQQ W1UQW W1WQC W2CGP W2GX K2QQQ W1UV W3MJF W1UQW W1WQC W2CGP W2GX K2QQQ W1UV W3MJF W1UQW W1WQC W2CGP W2GX K2QQQ W8DLHI W7LVR W3MJF W4UQG W4YQG W4YQG W4YQG W4YQG W4YQG W5DLHI W7LVR W5DLHI W7LVR W5DLHI W7LVR W6DLN W6DLN W6DLN W6DLN W6DLN W6DLN W6DLN W6DLN W7LVR W7SFK W8BPQ W8DJ W8QAD W8VQD W8QD W8VQD W8QD W8VQD W8VQD W8VQD W8VQD W8QD W8VQD W8QD W8VQD W8VQD W8VQD W8VQD W8VQD W8VQD W8V
EA4DB EA6AB EA6AB EA6AB EA6AB EA6AB HB9CX HB9ID IIBNU IIZFF PAØOTC PY2AK TG9AZ ZS6Z 4X4FF  •108 WIBAV W3KTF W3MWP K4EJO W4LIM W7GJ W8RVU W9DOR W9MVO F9EZ IIRLH OZ5BW VE3EHR YV5GY ZS5GU •107 W10OS W2DCO W2DCO W2DCO W4LZM W7HLB W9MKJ W9MKJ W9MKJ W9MKJ W9MKJ W9MKJ W9TLB W9MKJ W9MKJ W9TLB W9MKJ W9KZC CA3FG G4MS G5OO HB9JZ ITIAFS OA4AO OP4APF PY6CO 4X4BL •106 W2IWC K2JFV W3AER W4LRG W5BQJ W4LRG W5BQJ W4LRG W5BQJ W11AFS OA4AO OP1AFS OA4AO OA4AO OP1AFS OA4AO OP1A
DJ2YI DL4KD F90R F90R F90R F90R F90R F90R F90R F90R
OE5CK OH3PB PY6CN VQ4SC YY52AG 3V8BB  •102 W2CCO W2DSB W2DSB W2DYR W2GBC W2GRQ K2LGS W2PBG W2QCP K2QXG K2LGS W2PBG W2QCP K2QXG K2LGS W2PBG W3AZD W3BYI W3FGN K4IOT W4KYB W4PKM W5NXE W6PWR W7YAM W5NXE W6PWR W7YAM W5NXE W6PWR W7YAM W5NXE W6PWR CY1DD U3BYI U3FGN K4IOT U4KYB W4PXAM W5NXE W6PWR W7YAM W5NXE W6PWR W7YAM W5NXE W6PWR W7YAM W5NXE W6PWR W7YAM U5NXE W6PWR W7YAM W5NXE W6PWR W7YAM W5NXE W6PWR W7YAM W5NXE W6PWR W7YAM W5NXE W6PWR W7YAM W8UUI W5NXE W6PWR W7YAM W6WSH C71DU C71ER C71FL CX7BA DJ2MM DL3TM DL3T
W4DEO W4GNT W4IIB W4KZF W4IIB W4KZF W4LPT W4IZM W5HWK W5JRF W5LFK W5ZS W6BYB W6KPC W6PKI W7DND W7JNC W8HTP W8NML W9ICF W9LIL W9MKF W9LIL W9MKF W9NLI W9LIL W9MKF W9NLI W1L K9HTP W1L K9NL W1L K1
W4EYG W4GLR W4GLR W4LGG W4NQN W4NYX W4PGZ W4RVL W4UWC W4DWC W4VBW W5CAI W3GZ W5NNW W5NXF W5URU W6EHN W6GRV K6KJR K6LGF W6NGZ W6OZE W6UZX W6OZE W6UZX W6ZZC W7ADH W7TGG W8ALC W7ADH W7TGG W8ALC W7ADH W7TGG W8ALC W8BRA W8CSN W8DXO W8DXO W8DXO W8DXO W8DXO W8DXO W8DXO W8UMR W8VGQ W9GZK W9HMG W9CZF W9GZK W

 All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

#### ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Richard B. Mestrov, W3JNQ—SEC: DVB, RM: AXA. PAM: TEJ. The E. Pa, Net meets Mon. through Fri. at 1830 on 3610 kc. The PFN meets Mon. through Fri. at 1800 on 3850 kc. The PFN meets Mon. through Fri. at 1800 on 3850 kc. The PFN meets Mon. through Fri. at 1800 on 3850 kc. PDJ resigned as RM because of business pressures, and AXA has returned as the new RM. Many thanks, Dick, for a job well done. The c.w. and phone nets both need outlets through the section, especially in the Philadelphia Area, If interested, contact the RM, PAM or SCM. BQA worked 10 new countries during September using his DX-100, bringing his total to 162. EAN has his Apache 2/3 finished. CMN is building an electronic key. BUR put on a.d. demonstration for his borough. WHK is practically QRT because of school. DVX received WTPA (Worked Two Punxsutawney Amateurs) No. 5. KN3DTL is on, via the help of SOC. UXX needs only a Zone 23 card for WAZ. ZSX is chasing his WAPC Award. VZC has given up mobile and has a Valiant and an HQ-150. GTQ has moved to Binghamton. FWI is now mobile. EFA has a new three-element 10-meter beam. NWJ has a Valiant and a DX-100. K3ANS is QRL with school work. HNK now has 100 per cent modulation on his peanut whistle, built by HNK and JVY. FCI is preparing to enter Penn. State. CUL finds that c.w. still can handle traffic better than s.s.b, and is rebuilding her antenna system. OM VR again sneaks into the shack and handles his own traffic. DHJ is operating from ZA/3W on 14-Mc. s.s.b. K3ALD. has worked 63 countries and was in the W/VE Test. EU is a "granpaw." The Lancaster RTS started code classes with 25 in attendance, VBI moved to Williamsport. EYY is recuperating from surgery. OLV turned in his usual good score in the V.H.F. Contest, KJJ is DXing on 13 a-band beam. UQV is married. K3AUW dropped the "N." DVB is QRL studying, teaching and with AFMARS. New officers of the Mike Farad RC are LJA, pres.; 4DAB/3, vice-pres.; AHZ, seev.; YFF, treas, EPL, GCC, ERJ and ATB put on a 10-hr,-day demonstration at

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Louis T. Croneberger, W3UCR—
Asst, SCM Delaware: Ray deCourcelle, 3DQZ, SEC:
YYB, Section Nets: MDD, 3650 ke, M-S 1915, MEPN
3820 kc, MWF 1800, SS 1300; De1EN 3905 ks, Sat. 1830.
New appointments: IWJ as OO, Your SCM had the
pleasure of speaking to the BARC at its Sept. 15th
meeting on "ARRL Appointments by the SCM," Mr.
Art Miller, Disaster Service, Baltimore Red Cross, thanked
the club members (BARC) at the same meeting for assistance in its recent disaster drill. UCR had the opportunity to present the new SEC (YYB) with his certificate and to meet many of the BARC members, RCARA
had "Tape Shorts of the National Convention Highlights" at its Sept. 12 meeting. On Sept. 26 KN3DZW
spoke on "His Experiences in Korea," which was illustrated by color slides. The Greenbelt ARA elected FVO,
pres.; GID, vice-pres.; JSK, seev.; and IWJ, treas. The
ARA held its Annual Hamfest at Cunningham Falls and
had a nice turnout. The MEPN has adopted a revised

emergency plan. Copies may be obtained from JNX. The WMRC has adopted an emergency alerting plan. The HCARA (K3CJT) notes that the members are monitoring 145.68 as well as 29.590 Mc. OPO has assumed duties as NCS for the "going-home crowd" on 29.520 Mc. (WMRC net frequency). New MDD members earning net certificates are K3BUV, CQX and QCW. K3BCA is Acting Novice Coordinator of the ARA and reports the Antietam Novice Net will resume its full fall schedule on 21.150 Mc. EDA gave a talk on amateur radio to the Hagerstown Civitan Club, which resulted in good publicity in the Hagerstown newspapers. CVE reports publicity for PG Co. in the Oct. S.E.T. MCG and MSK are off again for Fort Churchill, Canada (VE4), for a couple of months. PQ will be Acting RM of MDD during Karl's absence. BKE reports a new Apache transmitter now is on the air. JZY reports receiving his WAZ and his antennas are back up for the winter season. New Novices are KN3s DUM using a DX-40 and an AR-3, GIT with a DX-40 and a Super-Pro, GJV on 2 meters with a Sonar rig, EFR and GMB. K3DEI is now General Class. G6VX was a recent visitor to the shack of MSR. YYB and JCL were co-chairmen of the amateur radio station activity (BARC—W3FT) held in Edmondson Village Sept. 18 through Oct. 18. Much traffic has been handled by the station and many have been acquainted with amateur radio for the first time. Congratulations to the BARC on a very fine project. Montgomery Co. RACES, in conjunction with the CAP and the Red Cross, conducted a special blood drop on Sept. 14. CKR and OMN coordinated the activity, with MLM, OBR and K3AUX participating. GKP reports good conditions on 2 meters the Labor Day week end, working 4AIB (South Carolina), 4EQM (Alabama) and many New England and W8 amateurs. UTR now has some antennas up through the efforts of K4LMB's group and some members of the RCARA. EDA has a nice trip to KP4-Land, visited KP4s AEQ, ABD, VJH and MS and was met at the airport by AND. BCB has started a 2-year hitch in the Army. Sorry to report the passing of WN3J emergency plan. Copies may be obtained from JNX. The or each month for the preceding month. Club secretaries are invited to send meeting notices, etc., with regular club mailings. This is your column, let's hear from you. A very Merry Christmas to all. Traffic: W3UE 340, CVE 188, MCG 167, K3WBJ 154, W3BUD 133, TN 72, COK 68, QCW 60, CN 49, CQZ 6, BKE 4, FNM 4.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. PAM: W2ZI. RMs: W2YRW, W2HDW and W2ZI. K2EFA, Millville, is the new EC for Cumberland Co. With regret I report the passing of W2ASG (an ex-SCM) and W2YT K2OOK

new EC for Cumberland Co, With regret I report the passing of W2ASG (an ex-SCM) and W2YT. K2OOK made BPL and again was top traffic-handler in the section. W2HDW, NJN manager, issued a fine bulletin and net roster. K2EVW, Margate, is a fine outlet for shore traffic. W2BZJ, Pennington, has increased power and added a new antenna. W2ZI is moving to a new QTH. Ed was speaker at the October meeting of the Southern Counties Club. K2SOX, Vincentown, is commuting to Margate daily. K2PPT, Burlington, won top section honors in the July CD Contest. W2DBP, W2WKI and K2BG are conducting training classes at the Burlington. CD Margate daily, K2PPT, Burlington, won top section honors in the July CD Contest. W2DBP, W2WKI and K2BG are conducting training classes at the Burlington C.D. Headquarters. K2CPR, Pennsauken, reports his DX score is now 237/228. W3JSL, Hyattsville, Md., is attending school in Blackwood. The SJRA's pienie was a big success with over a thousand attending. W2ESX is SJRA's V.H.F. Contest chairman. K2HPJ, K2GSJ, K2MPV, K2PWV, K2MNZ and K2SJL have dropped the "N." The Burlington County Radio Club has a new QTH. Contact K2INQ, the club's secretary, for information. K2SOW, Princeton, is attending Phillips Exeter Academy, Pennsauken C.D. Headquarters is now fully equipped. K2PTJ is its Radio Officer. W2LS, Pleasantville, continues to do a fine job as Official Observer. All appointees are urged to report their activities the first of each month, Traffic: K2OOK 577, W2HDW 149, K2JGU 100, W2ZI 27, K2PPT 9, K2SOX 9, W2BZJ 5, K2CPR 5, K2EWR 4.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2PPY, RMs: W2RUF and W2ZRC. PAMs: W2PVI and W2LXE (v.h.f.). NYS C.W. meets on 3615 kc, at 1800, ESS on 3590 kc, at 1800, NYSPTEN on 3925 kc, at 1800, LSN on 3970 kc, at 1900, Appointments: K2IXB as OO Class IV; K2MMI and K2IXB as (Continued on page 134)

# One Thing is Crystal Clear-Your Signal



# Exclusive HT-32 High Frequency Crystal Filter System a major, proven advance... cuts unwanted sideband at least 50 db.

Now Proven superior — vastly superior to any other type filter—is Hallicrafters' exclusive 5.0 mc. quartz crystal filter system.

Result of a three-year research program, the system makes possible, for the first time, high frequency filtering. Result: unprecedented rejection of unwanted sideband—50 db. or more—and the cleanest signal of all, bar none.

This and another major technical advance—Hallicrafters' exclusive Bridged-Tee Modulator—make the HT-32 the most wanted SSB transmitter in history.

Meets FCDA Specifications

Export Sales: International Division Raytheon Manufacturing Company Waltham, Massachusetts

#### Compare these features

- 5.0 mc. quartz crystal filter cuts unwanted sideband 50 db. or more.
- Bridged-Tee modulator; temperature stabilized and compensated.
- SSB, AM or CW output on 80, 40, 20, 15, 11-10 meter bands.
- High stability, gear driven V.F.O.
- 144 watts peak power input.
- Distortion products down 30 db. or more.
- Complete band switching.

Proof of the HT-32's superiority is heard on ham bands night after night. Listen. You won't be satisfied with anything but the cleanest signal on the air. The HT-32 is available with convenient terms from your Radio Parts Distributor.

The new ideas in communications

are born at ...

In our 25th year of service





# EDISON AWARD NOMINATION DEADLINE JAN. 5

The final postmark date for letters naming candidates for the 1958 Edison Award is January 5, 1959. Only a short time remains to send in your nomination of an amateur who has rendered an important public service.

The judges for the Award will consider only those persons who are named in letters from you and others. Accordingly, you will be serving the entire amateur group by choosing a candidate and writing to the Edison Award Committee about him.

Below are some of the many selfless activities that can make an OM or YL eligible for consideration. For terms and rules of the Edison Award, see the October issue of this magazine, or write to Edison Award Committee, General Electric Company, Electronic Components Division, Owensboro, Kentucky.

#### HERE ARE TYPICAL ACTIVITIES THAT CAN QUALIFY FOR THE AWARD:

Emergency communications work in a disaster, such as a flood, hurricane, tornado, or an explosion.

Helping amateurs and others with their specialized problems, through professional knowledge and experience.

Publishing a book or other literature that contributes to general scientific knowledge or procedure.

Helping disabled or physically handicapped persons.

Relaying messages from remote points for the benefit of isolated servicemen and civilians.

Designing and constructing radio equipment for use by persons in remote parts of the world, who do not have access to regular commercial communication channels.

Civil-defense organization work; weather reporting; radio assistance to state or local traffic and police authorities; cooperation in forest-fire prevention and control.

Teaching young people the elements of electronics.

GENERAL ELECTRIC

new...

from Johnson...



A POWERFUL, COMPACT PHONE/CW RIG for 80 thru 6 METERS



Viking

# "CHALLENGER"

70 watts phone input 80 thru 6 meters!
120 watts CW input 80 thru 10 meters
... 85 watts CW input on 6 meters!

he new Viking "Challenger" is ideal for fixed ation, emergency, portable or field day use. full size transmitter with three RF stages, ie "Challenger" is designed for fast, easy ining, excellent stability and plenty of reserve rive! A single 6DQ6A buffer drives two husky DQ6A bridge neutralized tetrodes in the final nplifier. Hi "Q" wide range pi-network outut coupling ranging from 40 to 600 ohms will fectively tune out large amounts of capacitive inductive reactance. Plate circuit capacitor vitching provides the best combination of ariable and padding capacity for easy tuning nd proper loading. Straight through final amlifier operation even on 6 meters provides scellent efficiency and modulation charactertics—unit is designed for crystal control or xternal VFO.

Effectively TVI suppressed and filtered. With Johnson "LC" keying to provide true "shaped" CW waveform...no clicks, no chirps. For crystal or high impedance dynamic microphone. Complete with tubes and built-in power supply.

#### TUBE COMPLEMENT:

6AU6Oscillator
6DQ6ABuffer-Multiplier
6DQ6A (2) Final Amplifier
12AX7Cascade Speech Amplifier
6AQ5Clamper and Screen Modulator
5U4GBRectifier

Cat. No. \$11475 240-182-1... Complete Kit.. Amateur Net \$1240-182-2... Wired and Tested... Amateur Net \$154.75

For easy terms see your Johnson Distributor



E.F. Johnson Company

2841 SECOND AVENUE S. W. . WASECA, MINNESOTA





#### VIKING "PACEMAKER" TRANSMITTER/EXCITER

An outstanding power bargain when used as a transmitter or exciter! 90 watts SSB P.E.P. and CW input . . . 35 watts AM. Unique circuitry uses only 1 mixer for improved spurious signal rejection greater than 50 db. Balanced range audio. Highly stable built-in VFO gives complete coverage of bands without crystal switching or meters, VOX and anti-trip circuits. Wide range pi-net-work output. Effectively TVI suppressed. With tubes

, and crystals.

Cat. No. 240-301-2...Wired............ Amateur Net \$495.00

VIKING "THUNDERBOLT" AMPLIFIER
Rated at 2000 watts P.E.P.† input SSB; 1000 watts CW; 800 watts AM linear! Continuous coverage 3.5 to 30 mcs. -instant bandswitching. May be driven by the Viking "Ranger", "Pacemaker" or other unit of comparable output. Drive requirements: approx. 10 watts Class AB<sub>2</sub> linear, 20 watts Class C continuous wave. Employs two 4-400A tetrodes in parallel, bridge neutralized—wide

range pi-network output. With tubes.
Cat. No.
240-353-1. Kit.
240-353-2. Wired. Amateur Net ....\$524.50 ....\$589.50

#### **NEW VIKING "MATCHBOXES"**

275 WATT "MATCHBOX" Cat. No.

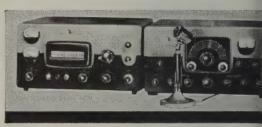
Provides completely integrated antenna matching and switch ing systems for kilowatt or 275-watt transmitters. Unit or 2/7-watt transmitters. Only complete with built-in directional coupler and indicator Bandswitching 80, 40, 20, 15, and 10 meters. Quickly an easily match transmitter to balanced or unbalanced line over a wide range of antenna impedances will tune out larg amounts of capacitive or inductive reactance. No "plug-in coils or "load-tapping" necessary.

250-23-3 With built-in Directional Coupler & Indicator . . . \$86.5 . \$54,9 250-23 Less built-in Directional Coupler & Indicator . KILOWATT "MATCHBOX" Cat. No. Amateur N

Amateur N

250-30-3 With built-in Directional Coupler & Indicator . . .\$149.5 250-30 Less built-in Directional Coupler & Indicator . . . . \$124.5

## 1st Choice Among the Nation's Amateurs ... Viking Equipment!



# For the strongest signal on the band!



Unequalled 100% broadcast-type high level amplitude modulation! Full 2000 watts SSB† input—1000 watts CW and AM!

VIKING "KILOWATT"

Brilliantly designed, and engineered specifically for high power operation, the Viking "Kilowatt" is the only power amplifier available which will deliver. signal with the authority of maximum legal power is all modes!

Class C final amplifier operation provides plat circuit efficiencies in excess of 70%. Final amplifie utilizes two 4-400A tetrodes in parallel, bridge neutral ized — wide range pi-network output. Continuous coverage 3.5 to 30 megacycles.

For unsurpassed enjoyment with every contact at unforgettable experience... step up to the very fines ... the thrilling Viking 'Kilowatt'! Cot. No. 240-1000... Wired and tested with tubes Amateur Net....\$1595.00

Matching accessory desk top, back and three drawe pedestal. Cat. No. 251-101-1..............FOB Corry, Pa. \$132.00

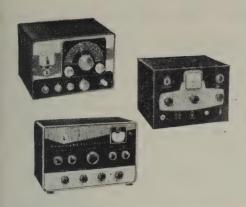
†The F.C.C. permits a maximum of one kilowatt average power input for the amatuer service. In SSB operation under norma conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics. This rating method suggested and approved by Technical Department ARRL.

For easy terms see your Johnson Distributor



E.F. Johnson Company

2842 SECOND AVENUE S. W. . WASECA, MINNESOTA



## Viking Transmitters --- More Effective Watts per Dollar!

#### VIKING "NAVIGATOR" TRANSMITTER/EXCITER

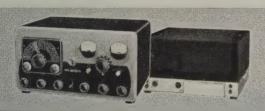
WRING NAVIGATOR TRANSMITTER, EXCITER
More than a novice transmitter—also serves as a flexible
VFO-Exciter delivering enough RF power to excite most high
powered amplifiers on CW and AM! 40 watts CW input—
6146 final amplifier tube—wide range pi-network output.
Built-in VFO or crystal control—bandswitching 160 through
10 meters. Timed sequence keying. TVI suppressed and
filtered. Complete with tubes, less crystals.

#### VIKING "ADVENTURER" TRANSMITTER

Perfect for the novice or experienced amateur! 50 watts CW input—instant bandswitching 80 through 10 meters, Crystal or external VFO control. Rugged 807 final amplifice tube-wide range pi-network output. Clean, crisp keying. TVI suppressed. Complete with tubes, less crystals.

#### VIKING "6N2" TRANSMITTER

This compact VHF transmitter punches your signal out with This compact VHF transmitter punches your signal out with 150 watts CW and 100 watts phone input. Instant bandswitching 6 and 2 meters. Completely shielded and TVI suppressed, the "6N2" may be used with the Viking "Ranger," Viking I, Viking II, or similar power supply/modulator combinations. Operates by crystal control or external VFO with 8-9 output. With tubes.





#### VIKING "FIVE HUNDRED" TRANSMITTER

Rated 600 watts CW input . . . 500 watts phone and SSB (P.E.P. with auxiliary SSB exciter)—instant bandswitching 80 through 10 meters! Compact RF unit designed for desk-top operation—power supply modulator unit may be placed in any convenient location. All exciter stages ganged to VFO tuning. High gain push-to-talk audio system. Operates by crystal control or highly stable, built-in VFO. Class C 4-400A final amplifier provides plate circuit efficiencies in excess of 70% with unequalled broadcast-type high level amplitude modulation. Wide range pi-network output circuit with silver-plated final tank coil will load virtually any antenna system. Low level audio clipping—effectively TVI suppressed and filtered. With tubes,

 Cat No.
 Amaretr Net

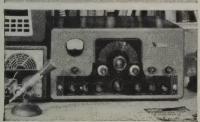
 240-500-1. Kit...
 \$749.50

 240-500-2. Wired.
 \$949.50

VIKING "COURIER" AMPLIFIER
This power-packed Class B linear amplifier is rated 500 watts P.E.P. input with aux. SSB exciter—500 watts P.E.F. input with aux. SSB exciter—500 watts CW and 200 watts AM! Continuous coverage 3.5 to 30 mcs. May be driven by the Viking "Ranger", "Pacemaker" or other unit of comparable output. Drive requirements: 5 to 35 watts. Employs two 811A triodes in parallel—wide range pinetwork, TVI suppressed. With tubes.

Amateur Nef 240-352-1. Kit......\$244.50 240-352-2. Wired....\$289.50





For easy terms see your Johnson Distributor

#### VIKING "RANGER" TRANSMITTER/EXCITER

Superbly engineered . . . delivers solid audio punch! This popular 75 watt CW or 65 watt phone transmitter also serves as an RF/audio exciter for high power equipment. Built-in VFO. or crystal control—instant bandswitching 160 through 10 meters. 6146 final amplifier—wide range pi-network output. Timed sequence keying. TVI suppressed. With tubes, less crystals.

#### VIKING "VALIANT" TRANSMITTER

Here's effective power, wide flexibility, and many unique operating features combined in a compact desk-top transmitter! 275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) and 200 watts phone. Instant bandswitching 160 through 10 meters—built-in VFO or crystal control. Final amplifier utilizes three 6146 tubes in parallel—wide range pi-network output. Silver-plated final amplifier inductor—built-in low pass audio



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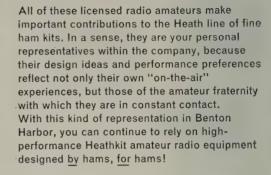














REX KEGND











# HEATH hams work to bring you



ROGER MACE (W8MWZ) SENIOR HAM ENGINEER HEATH COMPANY

# HEATHKIT 50-WATT CW TRANSMITTER KIT

MODEL DX-20



If high efficiency at low cost in a CW transmitter interests you you should be using a DX-20! It employs a single 6DQ6A tube in the final Amplifier stage for plate power input of 50 watts. The oscillator stage is a 6CL6, and the rectifier is a 5U4GB. Single knob band-switching is featured to cover 80, 40, 20, 15, 11 and 10 meters, and a pi network output circuit matches antenna impedances between 50 and 1000 ohms to reduce harmonic output. Designed for the novice as well as the advanced class CW operator. The transmitter is actually fun to build, even for a beginner, with complete step-by-step instructions and pictoria diagrams. All the parts are top-quality and well rated for their application. "Potted" transformers, copper-plated chassis, and ceramic switch insulation are typical. Mechanical and electrica construction is such that TVI problems are minimized. If you desire a good clean CW signal, this is the transmitter for you Shpg. Wt. 19 lbs.

#### **HEATHKIT "APACHE" HAM TRANSMITTER KIT**

- Newly Designed VFO-Provision For S.S.B. Adapter
- . Modern Styling Rotating Slide Rule Dial

MODEL TX-1 \$229<sup>50</sup>

Shipped motor freight unless otherwise specified, \$50.00 deposit required on C.O.D. orders.

Fresh out of the Heath Company laboratories, the brand-new "Apache" model TX-1 Ham Transmitter features modern styling and is designed as a handsome companion to the also-new Heathkit "Mohawk" receiver. The "Apache" is a high quality transmitter operating with 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, the "Apache" features built-in switch selected circuitry providing for single-sideband transmission through the use of a plug-in external single-sideband adapter. These Heathkit adapters will be available in the near future. A compact, stable and completely redesigned VFO provides low drift frequency control necessary for single-sideband transmission. An easy-to-read slide rule type illuminated rotating VFO dial with vernier tuning provides ample bandspread and precise frequency setting. Simple band-switching control allows flip-of-the-wrist selection of the amateur bands on 80, 40, 20, 15 and 10 meters (11 M with crystal control). The "Apache" features adjustable low level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL-34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation.



The final amplifier is completely enclosed in a perforated aluminum shielding for greater TVI protection and transmitter stability. Cabinet comes completely preassembled with top hatch for convenient access without taking chassis out of cabinet. Die-cast aluminum knobs and front panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. Incorporates all the refinements necessary with many "plus" features for effective and dependable communications. Shpg. Wt. 115 lbs,

# ...top quality at lowest prices!

#### HEATHKIT "MOHAWK" HAM RECEIVER KIT

- All Critical Circuits Prewired and Aligned
- Crystal Controlled Oscillators for Drift-Free Reception

MODEL RX-1 **\$274**95

Shipped motor freight unless otherwise specified. \$50.00 deposit required on C.O.D. orders.

Outstanding results can be expected with the new "Mohawk" receiver which is designed to combine all the necessary functions required in a high quality communications receiver. A perfect companion for the Heathkit "Apache" transmitter, the "Mohawk" features the same wide-band slide rule type vernier tuning and covers all of the amateur bands from 160 through 10 meters on seven bands with an extra band call brated to cover 6 and 2 meters using a converter. External receiver powered, accommodations are available for these converters which will be available in Heathkits soon. The "Mohawk" is specially designed for single-sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled, wired and aligned front end assures ease of assembly. All critical wiring is done for you insuring top performance. This 15tube receiver features double conversion with IF's at 1682 kc and 50 kc. Five selectivity positions from 5 kc to 500 CPS. A



bridged T-notch filter is employed for maximum heterodyne rejection. Complete accuracy is obtained with the use of a built-in 100 kc crystal calibrator and the set features 10 db signal-to-noise ratio at less than 1 microvolt input. S-meter and many other fine features built-in for top-notch signal reception. Shpg. Wt. 90 lbs.

HEATH COMPANY

A Subsidiary of Daystrom, Inc.

BENTON HARBOR 9, MICH.

#### **HEATHKIT PHONE & CW TRANSMITTER KIT**



MODEL DX-40 \$6495

The DX-40 incorporates the same high quality and stability as the DX-100, but is a lower powered rig for crystal operation, or for use with an external VFO. Plate power input is 75 watts on CW, permitting the novice to utilize maximum power. An efficient, control-carrier modulator for phone operation peaks up to 60-watts, so that the rig has tremendous appeal to the general class operator also. Single-knob switching covers 80, 40, 20, 15, 11 and 10 meters. Pi network output coupling makes for easy antenna loading, and pi network interstage coupling between the buffer and final amplifier improves stability and attenuates harmonics. A line filter is incorporated for power line isolation. The efficient oscillator and buffer circuits provide adequate drive to the 6146 final amplifier from 80 to 10 meters, even with an 80-meter crystal. A drive control adjustment is provided, and the function switch incorporates an extra "tune" position so that the buffer stage can be pretuned before the final is switched on. A switch selects any of three crystals, or a jack for external VFO. High quality D'Arsonval meter for tuning. Shpg. Wt. 26 lbs.

#### HEATHKIT DX-100 PHONE & CW TRANSMITTER KIT

MODEL DX-100 \$18950

Shipped motor freight unless otherwise specified. \$50.00 deposit required on C.O.D. orders.

You get more for your transmitter dollar when you decide on a DX-100 for your ham shack! Recognized as a leader in its power class, the DX-100 offers such features as a built-in VFO, built-in modulator, TVI suppression, pi network output coupling to match a variety of antenna impedances from 50 to 600 ohms, pi network interstage coupling, and high quality materials throughout. Copper plated 16-gauge steel chassis, ceramic switch contacts, etc., are typical of the kind of parts you get, in assembling this fine rig. The DX-100 covers 160, 80, 40, 20, 15, 11 and 10 meters with a single bandswitch, and with VFO or crystal operation on all bands. RF output is in excess of 100 watts on phone and 120 watts on CW, with a pair of 6146 tubes in parallel for the final amplifier, modulated by a pair of 1625 tubes in parallel. VFO tuning dial and panel meter are both illuminated for easy reading, even under subdued lighting conditions. Attractive front panel and



case styling is completely functional, for operating convenience. Designed exclusively for easy step-by-step assembly. No other transmitter in this power class combines high quality and real economy so effectively. Here is a transmitter that you will be proud to own. Time payments are available. Shpg. Wt. 107 lbs.

# more fine ham gear from the pioneer



#### HEATHKIT GRID DIP METER KIT

A Grid Dip Meter is basically an RF Oscillator used to determine the frequency of other Oscillators, or tuned circuits. Numerous other applications such as pretuning, neutralization, locating parasitics, correcting TVI, ad justing antennas, designing new coils, etc. Features continuous frequency coverage from 2 MC to 250 MC, with a complete set of prewound coils, and to 500 ua panel meter. Has sensitivity control and a phone jack for listening to the "Zero-Beat". It will also double as an absorption-type wave meter Shpg. Wt. 4 lbs.

MODEL 6D-18

Low frequency coil kit: two extra plug-in coils extend frequency coverage down to 350 KC. Shpg, Wt. 1 lb. No. 341-A \$3.00

\$2195

HEATH COMPANY

A Subsidiary of Daystrom, Inc.

BENTON HARBOR 9,

#### HEATHKIT ALL-BAND COMMUNICATIONS-TYPE RECEIVER KIT

Ideal for the short wave listener or beginning amateur, this Receiver covers 550 KC through 30 MC in four bands. It provides good sensitivity and selectivity, combined with fine image rejection. Amateur bands are clearly marked on the illuminated dial scale. Features transformer type—power supply—electrical band spread—antenna trimmer—separate RF and AF gain controls—noise limiter—internal 5½" speaker—head phone jack and AGC. Has built-in BFO for CW reception. An accessory power socket is also provided for connecting the Heathkit model QF-1 Q Multiplier. Will supply 250 VDC at 15 ma MODEL AR-3 and 12.6 VAC at 300 ma. Shpg. Wt. 12 lbs.

Cabinet: Fabric covered cabinet with aluminum panel as shown part 91-15A. Shpg. Wt. 5 lbs. \$4.95

\$29<sup>95</sup>

### HEATHKIT ELECTRONIC VOICE CONTROL KIT

Here is a new and exciting kit that will add greatly to your enjoyment in the ham shack. Allows you to switch from Receiver to Transmitter merely by talking into your microphone. Lets you operate "break-in" with an ordinary AM transmitter. A terminal strip is provided for Receiver and speaker connections and also for a 117 volt antenna relay. Unit is adjustable to all conditions by sensitivity and gain controls provided. Easy to build with complete instructions provided. Requires no transmitter or Receiver alterations to operate.

\$2395\$

#### HEATHKIT "Q" MULTIPLIER KIT

This fine Q Multiplier is a worthwhile addition to any communications, or Broadcast Receiver. It provides additional selectivity for separating signals, or will reject one signal and eliminate a hetrodyne. Functions with any AM Receiver having an IF frequency between 450 and 460 KC that is not AC-DC type. Operates from your Receiver power supply, and requires only 6.3 VAC at 300 ma (or 12.6 VAC at 150 ma), and 150 to 250 VDC at 2 ma. Simple to connect with cable and plugs supplied.

Simple to connect with cable and plugs supplied.

MODEL QF-1 Effective Q of approximately 4000 for sharp "peak" or "null". A tremendous help on crowded phone or CW bands. Shpg. Wt. 3 lbs.



ALL-BAND RECEIVER



ELECTRONIC VOICE CONTROL



"Q" MULTIPLIER

NOTE: \$10.65 WHEN ORDERED WITH AR-3 BECAUSE OF EXCISE TAX.

# ... in do-it-yourself electronics!

## HEATHKIT "AUTOMATIC" CONELRAD

Designed to give instant warning whenever a monitored station goes off the air, the CA-1 automatically cuts the AC power to your transmitter, and lights a red indicator. Works with any radio receiver; AC-DC—transformer operated—battery powered, so long as the receiver has AVC. A manual "reset" button is provided to reactivate the transmitter. Incorporates a heavy-duty 6-ampere relay, a thyratron tube, and its own built-in power supply.

A neon lamp shows that the alarm is working. Simple to install and connect with complete instructions provided for assembly and operation. Shpg. Wt. 4 lbs.

\*1395



"AUTOMATIC"
CONELRAD ALARM

#### HEATHKIT VARIABLE FREQUENCY **OSCILLATOR KIT**

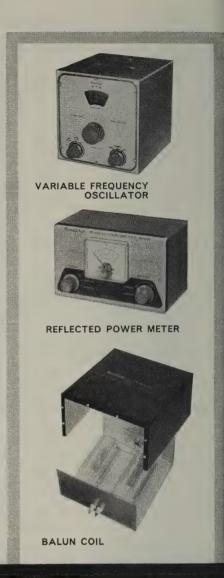
Enjoy the convenience and flexibility of VFO operation by obtaining this fine variable frequency oscillator. It covers 160-80-40-20-15-11 and 10 meters with three basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Requires 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a, available on most transmitters. It features voltage regulation for frequency stability, and has illuminated frequency dial. VFO operation allows you to move out from under interference and select the portion of the band you want to use without having to be tied down to only 2 or 3 frequencies through the use of crystals. "Zero in" on the other fellows signal and return his CQ on his own frequency! Shpg. Wt.

#### HEATHKIT REFLECTED POWER METER KIT

A necessity in every well equipped ham shack, the model AM-2 lets you check the match of the antenna transmission system, by measuring the forward and reflected power or standing wave ratio. Handles up to one kilowatt of energy on all bands from 160 to 2 meters, and may be left in the antenna system feed line at all times. Input and output impedances for 50 or 75 ohm lines. No external power required for operation. Meter MODEL AM-2 indicates percentage forward and reflected power. and standing wave ratio from 1:1 to 6:1. Shpg. Wt. 3 lbs.

#### HEATHKIT BALUN COIL KIT

This convenient transmitter accessory has the capability of matching unbalanced coax lines, used on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance. Design of the bifilar wound Balun Coils will enable transmitters with unbalanced output to operate into balanced transmission line, such as used with dipoles, folded dipoles or any balanced antenna system. Can be used with transmitters and MODEL B-1 Receivers without adjustment over the frequency range of 80 through 10 meters. Will handle power inputs up to 200 watts. Shpg. Wt. 4 lbs.



# save 1/2 or more . . . with HEATHKITS



FREE 1958 Catalog

Send for this Free Informative catalog listing our entire line of kits, with complete schematics and specifications.

Rush Free 1958 catalog.

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BENTON HARBOR 9, MICH.

a subsidiary of Daystrom, Inc.

name	
address	
city & state	

QUAN.	ITEM	MODEL NO.	PRICE

enclosed. Parcel post, Include postage—express orders are sent shipping charges collect. All prices quoted are Net F.O.B. Benton Harbor, Mich. and apply to Continental U.S. and Possessions only. All prices and specifications subject to change without notice.



# Communication Products Company, Inc.

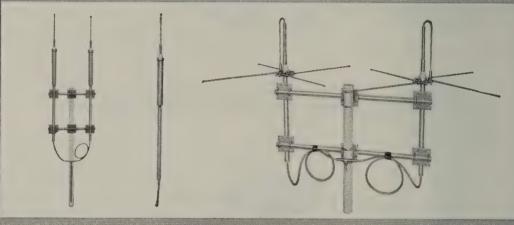


## service to industry with these products for 25 years

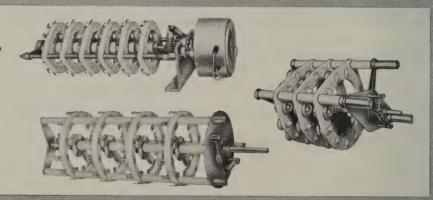
- COMMUNICATION ANTENNA SYSTEMS
- RF AND POWER ROTARY SWITCHES
- COAXIAL CABLES AND CONNECTORS
- COMMUNICATION TYPE CABLE DEHYDRATORS
- Q-MAX SUPERFINE RF LACQUER



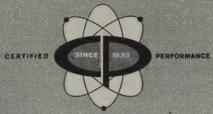
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COMMUNICATION ANTENNAS

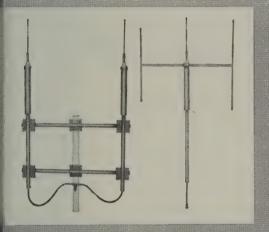


RF AND POWER ROTARY SWITCHES



COAXIAL CABLE AND CONNECTORS

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Q-MAX SUPERFINE



COMMUNICATION TYPE CABLE DEHYDRATORS















COMMUNICATION PRODUCTS CO., INC.



# BEST ENGINEERED BEST MANUFACTURED

# Singe 1933



# Communication Products Company. Inc.

#### MAIN OFFICE AND PLANT

Mariboro, New Jersey Phone—Freehold, New Jersey—FR 8-1880 TWX—FREEHOLD, NJ 843

#### SOUTHEASTERN SALES OFFICE

1709 Prudential Building, Jacksonville T Phone—EXbrook 8-8011 TWX—JK 46

#### PACIFIC COAST BRANCH

3043 Rosslyn Street, Los Angeles 65, Cal. Phone—CHapman 5-1144 TWX—GLENDALE, CAL 2177

- ham bands within frequency range of receiver. General coverage—540 KCS to 30.0 MCS in our bands. Electrical bandspread on all
  - slot filter and six-position selective crystal Unique combination of adjustable 60 db Dual conversion from 10.0 to 30.0 MCS.
    - 11-tube superheterodyne with improved iller for endless tuning techniques.
      - automatic noise limiter.
- 0.5 microvolt sensitivity on CW with 10:1 signal-to-noise ratio.
  - Optional plug-in type 100 KCS crystal Hammarlund quality design and construction throughout.

HAMMARUMO HO-ONE EDROVENE

# good look! take a

THIS IS THE NEW HO-145

GET COMPLETE DETAILS. WRITE FOR HQ-145 BROCHURE ...

# HAMMARLUND

HAMMARIUND MANUFACTURING COMPANY, INC. 460 West 34th Street, New York 1, New York

\$26900

amateur net Telechron Clock-timer, optional, \$10 extra

Plug-in 100 KCS crystal calibrator, \$15.95 extra.

is another winner in the ever-growing line of quality Hammarlund receivers-whatever your needs and budget, you'll find your best Take a good long look at the features offered in this newest Hammarlund receiver, Never before has so much been offered in a general-coverage receiver at such a low price. The all-new HQ-145 buy is a Hammarlund!



#### GOTHAM ON ANTENNAS · · · · · · some questions and answers

As one of the oldest antenna manufacturers consistently advertising in  $\mathcal{L}ST$ , we think it is a good idea to sum up our activities, comment on the antenna industry, and answer questions that arise year after year.

We have seen scores of antenna manufacturers come along with new designs, run an ad or two, perhaps linger longer, then disappear. Almost always the pattern ran: A new super antenna that could be made for pennies was advertised at fantastically high prices, accompanied by fantastic blurbs for its performance. A few antennas would be sold, and the manufacturer would sadly discover that only antennas that had stood the test of time could sell in sufficient quantities to cover all costs. As a result of these scores of failures, 'orphan' antennas still pop up plaintively in 'Used Equipment' bargain columns.

From the moment Gotham made its first antenna, there has always been continued acceptance of Gotham antennas as the standard of the amateur radio field. We are very proud of the fact that every one of our beams is a full half-wave in element size, justifying the hams' faith in our basic design.

To sum up our present plans, Gotham will continue to manufacture fifty ham antennas at low, low prices. Our only new venture for the foreseeable future is a new lowcost marine radio-telephone antenna, which will bring an added measure of safety to mariners, due to a new efficient design. Literature is available.

And now to answer some questions: Why is the Gotham price so very low? Doesn't the low price mean a lack of quality? Answer: The Gotham price is low because we sell in quantities and make only a fair profit on each antenna. We do not add on a tremendous overhead and engineering charge. As for quality, we have always used the best materials, and every antenna is doubly inspected before shipment. Thousands of Gotham antennas are in use the world over.

Why are all Gotham beams of the Yagi type, all metal, and grounded at the center? Answer: To get the maximum strength for the minimum weight, to get maximum efficiency, and to avoid the use of wood, tuning stubs, traps, or other substitute devices, all of which are undesirable and unnecessary. In addition, grounded beams are lightning-proof and protect your home.

How do Gotham beams gain compare with higher priced antennas? Answer: No beam, regardless of price, can give more gain, for a given boom size, than a Gotham beam. Obviously, the more elements, the more gain. Our gain figures are published in our literature, and are available, free, on request.

What matching systems are available in Gotham beams? Answer: We use both the Gamma match for 52 and 72 ohm coaxial feed, and the T match for 300 ohm feed. These are tried and true matching systems, proven by thousands of hams, and extremely simple. No electronic equipment or measuring devices are needed. Everything is furnished.

How difficult is it to put a Gotham beam together? Answer: It's easy, and it takes only a few moments. No special tools are required for assembly and installation. Full, simple instructions are given, and all machining and cutting is done at the factory. Thousands of novices have successfully assembled and installed our antennas.

What is the difference between the Standard and the DeLuxe beams? Answer: The Standard beams in the 6, 10, and 15 meter bands used  $\frac{5}{8}$ " and  $\frac{3}{8}$ " tubing elements; the DeLuxe models for these bands use  $\frac{7}{8}$ " and 1" tubing. In the 20 meter beams, the Standard beams have a single boom, while the DeLuxe beams use twin booms. All 20 meter beams use full 12 foot booms. In the 20 meter beams and in the Twobanders and Tribanders, only  $\frac{7}{8}$ " and 1" tubing are used.

Is the Gotham aluminum tubing corrosion-proof? Is is strong? Answer: Yes, our aluminum has an 'aluminized' finish, both on the inside and outside surfaces, and is

corrosion-proof. As for strength, our 6063T832 alloy has a yield strength of 40,000 lbs/sq. in.

Is it advantageous to use a Gotham Twobander or Tribander beam? Answer: Hundreds of these beams are in daily use. They are compromise beams, but by having each element a full half-wave, their gain figures are more than reasonably good. Of course a single three element beam on a single band will outperform a Tribander on that band, but the Tribander permits beam operation on three bands.

Are Gotham beams complete? Answer: Yes, we furnish everything — all tubing, fittings, castings where required, instructions — nothing extra to buy. We do not price an antenna piecemeal.

Do any Gotham antennas require guying? Answer: No. Our antennas have been designed to be self-supporting, due to the combination of tremendous strength and light weight. Whereas thin-walled or trapped verticals must be guyed, our 23 foot vertical antenna has come through hurricane winds without damage.

Do the Gotham verticals perform well on all bands? Answer: Yes, thousands of ham users attest to their efficiency on all bands from 6 to 160 meters. Reports of tremendous  $D\bar{X}$  on low power are common.

Are mounts supplied with the vertical antenna? Answer: Yes, four mounting straps for side mounting are furnished with each vertical.

Are radials needed with a Gotham vertical? Answer: No, except in a few rare locations. 99% of the installations are done without radials.

Must a vertical antenna be mounted at any particular height? Answer: No, any convenient height will do. The higher, the better.

How do you change bands on a Gotham vertical? Answer: For 20, 15, 10, and 6 meters, the loading coil is not used. For 40, 80, and 160 meters, the proper portion of the loading coil is used.

Do you need a separate loading coil for each band? Answer: No, a V160 loading coil will cover 160, 80, 40, 20, 15, 10 and 6; a V80 loading coil will cover 80, 40, 20, 15, 10, and 6; a V40 loading coil will cover 40, 20, 15, 10, and 6 meters.

How much power can be used with a Gotham vertical? Answer: Anything up to the legal limit.

Is much space required for installing a vertical? Answer: No, only a few square inches are needed.

Can you give details on the loading coil used in the Gotham verticals? Answer: Yes, it is made for us by Barker and Williamson. It is 3" in diameter and exceptionally rugged. No other loading coil in the antenna industry has a higher Q.

Which do you recommend buying, a vertical or a beam? Answer: A beam is always preferable for use on any particular band. The beam cuts down QRM and amplifies the transmitted and received signal. The vertical has the advantages of small space, low cost, no rotator required, and multi-band coverage.

Why does Gotham make so many different antennas? Answer: To meet the needs of hams everywhere for a wide variety of antennas, on all bands.

What antennas are best for a novice? Answer: The V80 vertical and the S153N beam are the most popular choices.

Why should a ham buy a Gotham antenna? Answer: The tremendous progress of the amateur radio art makes it imperative that hams graduate from the antiquated antennas of years past to a modern antenna system. We will be glad to send, free of charge, our technical literature on our 50 antennas, or you can order for immediate shipment.

73, GOTHAM

# 10% PRICE SLASH!

TAKE 10% OFF WHEN ORDERING

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST

1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

#### TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. Proven Gatham Value!

4 10 TWO	DANIDED		¢20.05
9-10 TWO	BANDER		\$29.90
10-15 TWO	BANDER		34.95
10-20 TWO	BANDER	П	36.95
15-20 TWO	BANDER	П	38.95

#### TRIBANDER

Do not confuse these full-size Tribander beams with socalled midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander

6-10-15	\$39.95	□ 10-15-20	\$49.95
	7 - 1 - 1 - 1		

#### 2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

boom.			
Deluxe 6-Element	9.95	12-EI	16.93

#### 6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do with a Gotham six meter heam.

can do, with a Gotham Six-meter beam.					
Std. 3-El Gamma match	12.95	T match 14.95			
Deluxe 3-El Gamma match	21.95	T match 24.95			
Std. 4-El Gamma match	16.95	T match 19.95			
Deluxe 4-El Gamma match	25.95	T match 28.95			

#### 10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30-50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

Std. 2-El Gamma match	11.95	T match 14.95
Deluxe 2-El Gamma match	18.95	T match 21.95
Std. 3-El Gamma match	16.95	T match 18.95
Deluxe 3-El Gamma match	22.95	T match 25.95
Std. 4-El Gamma match	21.95	T match 24.95
Deluxe 4-El Gamma match	27.95	T match 30.95

#### New! Ruggedized Hi-Gain 6, 10, 15 METER

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

tra	nsmiss	sion lii	ne ye	ou will u	ise.		-
	Beam	#R6 (	6 M	eters, 4-	EI) :	\$38.95	_
	Beam	#R10	(10	Meters,	4-EI)	40.95	
	Beam	#R15	(15	Meters,	3-EI)	49.95	

#### 15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

#### 15 METER BEAMS

Std. 2-El Gamma match	19.95	T match 22.95
Deluxe 2-El Gamma match	29.95	T match 32.95
Std. 3-El Gamma match	26.95	T match 29.95
Deluxe 3-El Gamma match	36.95	T match 39.95

#### 20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

Std. 2-El Gamma match	21.95	T match 24.95
Deluxe 2-El Gamma match	31.95	T match 34.95
Std. 3-El Gamma match	34.95	T match 37.95
Deluxe 3-El Gamma match	46.95	T match 49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

#### ALL-BAND VERTICAL ANTENNAS

You could work the whole world, and get fantastic reports, with a Gotham vertical and only 55 watts, like VP1SD.

You could work tremendous skip and DX, and be surprised at the way your Gotham vertical brings them in, as R. E. C. of Washington, D. C., found out.

You could have a simple, easy-to-install-and-operate vertical antenna, and switch from band to band, as thousands of Gotham customers have done.

Ш	\$14.95
	V80 vertical for 80, 75, 40, 20, 15, 10, 6
	meters\$16.95
	V160 vertical for 160, 80, 75, 40, 20, 15,
	10, 6 meters\$18.95

HOW TO ORDER. Send check or money order directly to Gotham or visit your local distributor. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.



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# Gonset's feature-packed equipment...

# Two wonderful Christmas "packages"

The man who takes the wrapping off either of these two handsome fixed station packages Christmas morning is going to be happy indeed. Either "package" offers the sure, inexpensive means for putting a signal with real authority on its respective band. Bear in mind, everything's in one compact cabinet: 50 watt transmitter

with pi net-work and calibrated VFO (or optional crystal) ... sensitive, selective communications receiver ... AC power supply. All elements are completely integrated, operate perfectly together. "Packaging" eliminates extra cost of several individual units, gives excellent performance ... exceptional value.



#### 6 METER FIXED-STATION COMMUNICATOR

- Coverage, 50-54 megacycles
- Complete 6 meter station...50 watts input...
  - Type 6146 tube with pi network output...
  - Stable, calibrated VFO with spotting switch to aid tuning. Optional xtal control...
    - Highly selective, sensitive receiver...
    - Adjustable squelch...noise limiter...
       "S" meter, panel mounted speaker...
  - Heavy-duty 115V AC power supply built-in
    - Case is attractive Alpine White with knobs in Gunmetal Blue.

No. 3221 ..... 319.50



#### 10 METER FIXED-STATION COMMUNICATO

- Coverage 28-29.7 megacycles.
- Complete 10 meter station...50 watts input...
- Type 6146 tube with pi network output...
- Stable, calibrated VFO with spotting switch to aid tuning. Optional xtal control...
- Highly selective, sensitive receiver...
- Adjustable squelch...noise limiter...
   "S" meter, panel mounted speaker...
- Built-in heavy duty 115V AC power supply
- Case is attractive Alpine White with knobs in Gunmetal Blue.

No. 3204 ..... 299.50

#### "THIN-PACK" 12V DC POWER SUPPLY FOR G-66A RECEIVER

"Thin pack" power supplies for G-66A receivers offer considerable monetary savings over the standard 3-way supply. Saves space too. Plugs into rear of G-66B and when so arranged, extends the overall case length by only 23". Speaker is not included. 12V DC only.

See special "Thin-pack/G-66A" offer on next page.



## GONSET

BURBANK, CALIF.

DIVISION OF YOUNG SPRING & WIRE CORPOR

# for a more memorable Christmas

# Mobile "must" for anyone's Christmas list!

Peek over any mobile man's shoulder at the list of things he would like most for Christmas. Chances are excellent that the list will include one or more items of the featurepacked Gonset line of mobile and fixed communications equipment. This can be the Christmas you join other happy owners of Gonset's "Twin Sparklers", G-66B receiver and the G-77A transmitter, the ideal combination for mobile. Now is indeed the time . . . because a special Gonset Holiday Offer gives extra stretch to those Christmas dollars. (See details at bottom of page.)



G-66B RECEIVER

6-BANDS: 540-2000 kcs. 3500-4000 kcs. 7000-7300 kcs. 14,000-14,350 kcs. 21.000-21.450 kcs. 28,000-29,700 kcs.

AM, CW, SSB RECEPTION: Highly stabilized HF and BF oscillators and crystal controlled second conversion oscillator.

STEEP SKIRT SELECTIVITY: 265 kc 2nd I-F. 8-high Q tuned circuits, 3.5 kc I-F bandwidth at 6 dh down.

DOUBLE CONVERSION ALL BANDS: 2050 kc 1st I-F. Double input tuning, (3 tuned circuits) on high bands for high image rejection.

AVC — Noise limiter — Panel S meter — antenna trimmer — BFO Pitch — Audio/RF gain control — slide rule dial — 3 watts audio.



G-77A TRANSMITTER

FREQUENCY RANGE: 80-40-20-15-10 meters. VFO or xtal, switchable. Highly stable VFO, each band spread over most of slide rule dial.

FULL BANDSWITCHING: Exciter ganged with VFO. Pi network output.

POWER INPUT: 50-60 watts, modulated. CW provisions. 6146 tube in output. New modulator has integral speech clipping. High gain speech permits PA-type dynamic, reluctance or crystal mikes.

POWER SUPPLY: Heavy-duty vibrator, 6V/12V DC. Also 115V AC. Output voltage 500-600V full load. Selenium rectifier. Low drain on standby and transmit. Power supply/modulator is separate unit.

# Special Holiday Offer

G-66B receiver, less power supply and speaker #3046 ..... 209.50 "Thin-pack" 12 V DC power supply for G-66A #3098 .... 29.50

G-77A transmitter with universal power supply for 6/12 volts DC and 115 volts AC #3203 ....

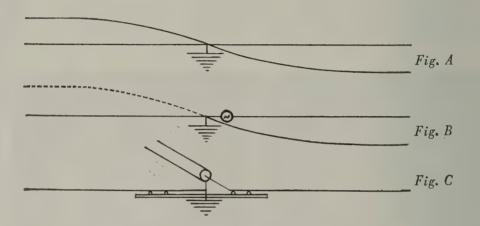
Total... Regular price 538.00

HOLIDAY 49900

IVISION OF YOUNG SPRING & WIRE CORPORATION

Among those Hams interested in beam antennas, many are concerned with the feed systems employed. It is for these Hams that we shall attempt to explain the wonderfully simple—yet highly efficient—feed system used in both the *Trap Master* and the *Power Master* series of MOSLEY beam antennas.

The beliefs that a balanced radiator element cannot be fed with an unbalanced line and that the impedance at the center of the element is not of a suitable value to permit direct connection of a 52 ohm coax line are not always correct. We will show, with authoritative references, that antennas can be designed to take advantage of the simplicity of such a system and still provide low VSWR over a broad bandwidth and a symmetrical radiation pattern. Page numbers will refer to the ARRL Antenna Book, seventh edition.



The voltage distribution over a half-wave radiator is shown in Fig. A. Since voltage is zero at the center, a ground may be placed at this point. (Page 26)

There are a variety of methods for introducing energy into the antenna. A balanced line may be connected directly to suitable points at each side of the grounded element center—a method commonly called the *delta* match or, with slight modification, T match. To connect an unbalanced line to a grounded un-split element, the *gamma* match from grounded center to a suitable point at one side of center may be used.

However, the element may be split at the center and fed with either a balanced line without a ground at the center or an unbalanced line with or without a ground at at the center. With an unbalanced line and ground on both the outer conductor (coax braid) and antenna center, a voltage introduced just off center in the position of the power source (Fig. B.) will introduce a voltage in this excited side, as shown. With the other half of the antenna element an integral part of the circuit, voltage will appear as indicated by the dotted line. Since the end of the feed line is fundamentally the same as a power source it may be replaced in the circuit, (Fig. C.), resulting in a balanced antenna fed with an unbalanced line. The ground at the center helps to minimize stray feed line currents to achieve the balanced pattern. (Further information on feeding balanced antennas with coax line can be found on pages 98-100) (See, also, page 224, Fig. 10-10).

Curves on page 169, Fig. 4-51, show how a three element beam, by correct tuning and element spacing, may present a feed point impedance of from 10 to 70 ohms. Of course, MOSLEY beams are tuned and spaced to present 52 ohms at suitable tuning points with low VSWR over the entire bands of operation and to achieve proper voltage distribution for a balanced radiation pattern.



Here's the full-size beam with full-size performance, for the ham who demands the best!

100% rust-proof . . . aluminum elements and boom . . . stainless steel hardware . . . high impact polystyrene insulators . . . all the finest . . . all built to last!

Each POWERMASTER is designed for a single band ... 10, 15 or 20 meters ... with low SWR over entire bandwidth.

A-310 — 3 elements, 10M, rated 1KW......\$37.50 A-315 — 3 elements, 15M, rated 1KW.....\$42.50 A-320 — 3 elements, 20M, rated 1KW.....\$77.25

If your dealer can't supply the POWERMASTER you want, write to

If You're a "Tribander,"

Be Sure and See the

Mosley TRAPMASTER Line

Mosley Electronics Inc.

8622 St. Charles Rock Road St. Louis 14, Mo.

# Wina free Prize!

Over \$1500 in prizes to be given away by TAPETONE, INC., Webster, Mass.

There has been a rapid growth of radio amateur 6 meter (50 mc band) activity. There are more TV stations with better antennas and operating with higher power. Other VHF communication services and man-made noise of various kinds has increased. All this has created serious problems of receiver overloading more so in city areas not considered in years gone by. Tapetone is vitally interested in this receiver design problem. To have more facts and information of these interference conditions and without regard to technical solution, Tapetone offers these prizes for:

The best description of interference conditions encountered in 50 mc reception. The judges will be guided by the most complete factual, accurate and informative entry describing these interference conditions.\*

\*Although technical solutions may be interesting and might later be published with proper credit to the writer, the judges will not give additional credit or be guided by these suggested technical solutions.

1ST PRIZE TAPETONE'S NEW "SKY SWEEP" 6 METER RECEIVER.

2ND PRIZE TAPETONE'S NEW "SKY HAWK" 6 METER TRANSMITTER.

TEN 3RD PRIZES YOUR CHOICE OF TAPETONE'S 11/4 METER, 2 METER OR 6 METER CONVERTERS.

100 HONORABLE MENTION GIFT CERTIFICATES VALUED AT \$5.00 EACH.

#### JUDGES:

A. A. FARRAR, W1CLS, Asst. Vice Pres., Raytheon Mfg. Company

A. E. COE, W1RVQ, Radio Shack, Boston.

E. C. HARRINGTON, W1JEL, Pres. Harrington Electronics

T. W. LANMAN, Pres. Tapetone, Inc.

#### RULES:

- All entries must be mailed to TAPETONE, INC., 10 Ardlock Place, Webster, Massachusetts, complete with entrant's name, address and call letters clearly indicated.
- 2. All entries must be postmarked before January 15, 1959 and received before midnight January 29, 1959.
- 3. Each entry will be judged on the basis of clarity, facts, and completeness. The judges' decision will be final.
- Only one prize will be awarded to a person. All entries become the property of TAPETONE, INC., to use as it sees fit, and none will be returned.
- 5. This contest is subject to all Federal, State and local regulations.
- All winners will be notified by mail by February 28, 1959 and a list of winners will appear in April QST.



Due to the response we have received on this contest, we are extending the contest to January 15, 1959. All entries must be received before midnight January 29, 1959.

TAPETONE, INC. 10 ARDLOCK PLACE, WEBSTER, MASS.



Tapetone, specialists in frequency conversions, now brings to the air waves an amazing, new six-meter receiver that will give you consistent top performance.

#### • RECEIVER FEATURES:

- \* Noise figure less than 3.6 db (0.5MV signal produces 10 db signal to noise).
- \* Long linear slide rule dial with smooth inertia tuning.
- \* Dial calibrated for 6, 2, 11/4 and 3/4 meter bands.
- \* Power available from receiver for future companion 2, 11/4 and 3/4 meter converters.
- \* Cascode RF amplifier.
- \* Linear detector for SSB and CW with AVC on or off.
- ★ Coverage 49.0 54.0 mc.

#### • CRYSTAL LATTICE FILTER ACHIEVES THESE FEATURES:

- ★ Band width at 6 db: 3.5 KC.
- \* Band width at 60 db: 12.5 KC.
- ★ Band pass flat to ±½ db for 3.0 KC. band width.
- \* Image rejection 60 db down.
- ★ Rejection of all other spurious and unwanted signals 70 db down.

We are specialists in frequency converters. We offer over 30 different models. Write for descriptive literature on all units.

TAPETONE, INC. 10 ARDLOCK PLACE, WEBSTER, MASS.

#### Station Activities

(Continued from page 110)

(Continued from page 110)

OBSs; K2RTN, K2QDT and K2EE as OPSs; K2MES as ORS. Endorsements: W2MTA as OBS; W2CXM and W2COB as OPSs. K2QPC is building an 829B rig for 6 meters. K2HUK is building a G-G 304TL linear for s.s.b. NYSPTEN NCS stations are K2BWK, K2RTN, K2MES, K2KJZ, K2KQC, W2PGA and W2ZDL. W2PVI is going RTTY. Congrats to W2COB on being high phone scorer in W.N.Y. and 2nd in New York State in the last CD Party. K2RAA and W2CTA constructed 2-meter transceivers. K2JFV has a new Tunuderbolt and 100 countries on s.s.b. K2YJN now has 50 countries on 15 meters. W2QQ has retired the old rig and now drives a Courier with a DX-40, K2UZJ worked 14 countries in 2 weeks with 30 watts and a new beam. K2RYH has been appointed Second Regional Net manager, K2RWY has a new Valiant. K2IQH, from Sherbourne, is now signing K42KS. Look for him on 10, 15 and 20 meters every day. K2PEY has used a transisterized rig on 6 meters with KA2KS. Look for him on 10, 15 and 20 meters every day, K2PEY has used a transisterized rig on 6 meters with excellent results. The Syracuse V.H.F. Club put on the program at the Sept. RAGS meeting. Subject? V.H.F. Have you joined the AREC? In registering your station facilities and your availability as an operator with the Amateur Radio Emergency Corps you are not obligating yourself financially or legally. You are merely indicating that your skill and station equipment are available to your community and country if needed, and that to this end you are willing to participate in organizational.

Amateur Kadlo Emergency Corps you are not obligating yourself financially or legally. You are merely indicating that your skill and station equipment are available to your community and country if needed, and that to this end you are willing to participate in organizational preparedness as part of a local and national amateur group. Contact your EC, SEC or SCM for further details. K21BS is mobile with the Gonset Twins. Other new mobilers include K2VCH, K2RQN and K2RDY. New officers of the Cornell ARC are K2OGG, pres.; K2CSD, vice-pres.; WN2TBF, secy.; KN2MIM, treas.; K2DEM, comm. mgr. Traffic: K2S1L 568, W2QDT 291, W2RUF 264, K2RYH 249, W2ATC 216, K2MES 156, K2IYP 132, K2GWN 130, K2KQC 96, W2Y1Y 62, K2AQQ 55, W20E 51, W2PGA 49, K2UZJ 49, K2QHR 44, K2JBX 37, K2JDD 37, K2RWV 36, W2COB 32, W2PV1 32, W2TPV 28, W2FEB 21, K2RIT 15, K2HUK 12, W2RUT 12, K2BCL 11, K2TPB 11, W2GSJ 8, K2RTN 7, K20BU 6, W2GBX 4, K2YJN 3, W2CXM 1, W2EMW 1.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: GJY, GEG and NUG. PAMs: AER and TOC. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. Certificate Mon. through Fri. at 1900 EST on 3585 kc. Certificate No. 2 for working all Pennsylvania counties (WAPC) goes to QHH. Congratulations. YOU and ZBY demonstrated ham radio to children at the D. T. Watson Home for Crippled Children. Leetsdale. BZR is attending school at Penn. State, ZKB has received D.U.F. certificate No. 3. CA now owns a Johnson Thunderbolt. K3AJB now has made WAS. LSS has a new Globe Champ. SIJ shows great prowess as a golfer, winning third place in the Dapper Dan Tourney. K3DEJ and K3BDI received Conditional Class licenses, UEM is convalescing from an illness. BJZ is overseas in England with the U. S. Air Force. GJY is the activities coordinator for the Baltimore and Ohio R. R. Amateur Radio Club. The AKARA, through QRN, reports that WGH has 220-Me. DXCC now; the Westinghouse Research hams are forming a 6-meter beam up. The Etna RC reports through the Oecilator that EDK now has WAS; K3AWU h KSI has a Mosley Tribander. SXH has been appointed c.d. director at Donora. Traffic: W3LXU 298, UGV 32, LSS 24, GJY 22, BZR 18, WRE 9, LOD 2, KBZ 1, UHN 1.

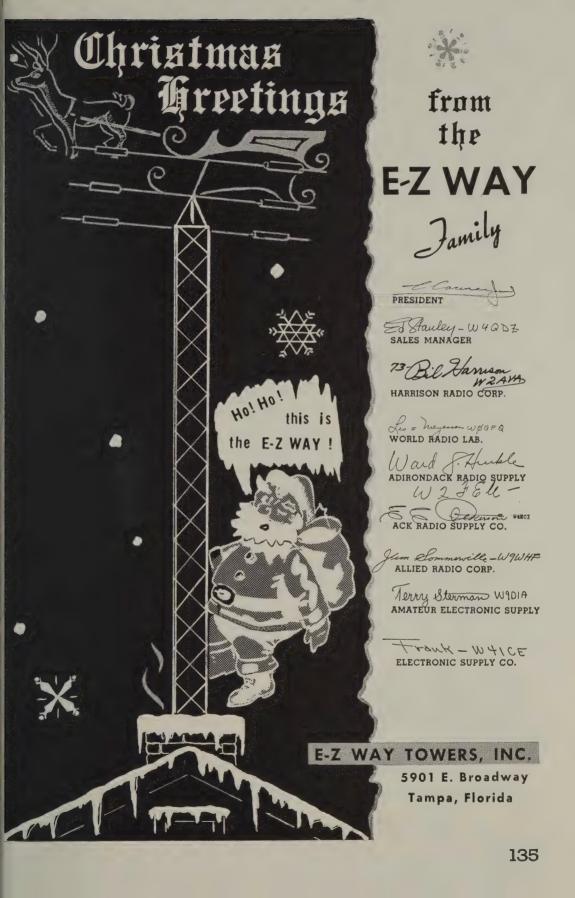
#### CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: HOA. RM: PCQ. PAM: RYU. EC Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. K9IXK made WAS. K9JIN is back on the air after a sick spell and is sporting a new 80-meter antenna. WBE is back at his home QTH after a summer operating on the SS North America with the call WTBA. JJN has his narrowband lattice-sweeping equipment working real FB. K9ISP

scored high in the latest VE/W Contest. New calls heard in Chicagoland are K9s OED, PDT, KN9s OXW, OZM and KL7BUU/M9. K9ERH's favorite subject is now Russian after receiving all those U DX QSL cards. K9MHW's winter project is the completion of a crystal-filter s.s.b. rig. MAK reports that the LLN handled 184 messages in 28 sessions and CSW and his North Central Phone Net completed 464 pieces of traffic. PCQ has now taken over the RM job and is giving MAK a much-deserved rest and more time for his studies. NIU enjoyed the APCO Convention in Baltimore. K9GUA has all the bugs out of his Apache and it is working 100 per cent with FB QSOs. The Peoria Hamfest was well attended and the gang had many an eyeball QSO. DRN is keeping schedules in the Chicago Area on 432 Mc. with a new section added to his tower. New radio club officers in the Rock Island Area are RYU, pres.; UCZ, vice-pres.; and K9EUF and DCV, seey. and treas.; with AKE, OWN and K9IDN, directors. EC VWJ is now mobile with a 147.3-Mc. f.m. rig. BON's new home-brew receiver for single sideband with a product detector is proving successful with DX signals. NN informs us that 86 DXCC members were present at the recent dinner in Chicago. SXL's XYL won a 6-meter converter as did LMS's XYL at the recent Peoria Area Radio Club's outing. IKR is now on 6 meters. GDI received his WAZ and also now has 200 countries confirmed. Hamfesters (Chicago) is again putting on a spree for s.s.b. building. A new OO appointee is K9HCP. Governor Stratton and Generals Homer and Woodward spoke at the opening of the new c.d. control center at Wheaton on Oct. 19. K9OSN has a new Valiant and is doing well with it. K9KWB finally received his Globe Chief transmitter. BA, EC of St. Clair County, has been transferred to a Biloxi AFB and will be missed by the Southern Illinois gang, especially those in the c.d. group which was spearheaded by him. Good luck, Tom. OHK, TCX, DIB and BAE were also in his group that left the area. K9AHY has a much-improved 6-meter signal with his new 75-ft. towe has added his Courier to his Pacemaker and is now going to town on all bands. Traffic: W9DO 774, K9GDQ 435, W9PCQ 180, FAW 172, MAK 131, K9ERH 127, MHW 100, ISP 45, W9IDA 44, JJN 39, RYL 18, WBE 15, CSW 12, K9JIN 10, W9PHE 7, K9IXK 4, BIV 2, KWB 2, W9TZN 2.

ISP 46, W9IDA 44, JJN 39, RYL 18, WBE 15, CSW 12, K9JIN 10, W9PHE 7, K9IXK 4, BIV 2, KWB 2, W9TZN 2.

INDIANA—SCM, Arthur G. Evans, W9TQC—Asst. SCM: Seth Lew Baker, 9NTA. PAMS: BKJ, KOY, SWD and UXK. RMs: DGA and TT. The nets have changed to CST, IFN meets daily at 0800 and M-F at 1800 on 3910 kc. QIN meets daily at 1900 on 3656 kc. RFN meets Sun. at 0700 on 3656 kc. CMT and JOZ have resigned as SEC and RM, respectively, because of increased demands of their business. I want to thank both of these men for their help during the past year. SNQ, our new SEC, is active in the nets and has been doing a fine job as EC for Jay County. VAY, now RM for QIN, has been very active on the c.w. nets for several years. Both of these men are going to need your support to do the kind of a job they would like to. K9BSU has been appointed ORS. The new officers of the Naval Avionics ARC are Comm. John Cassidy, pres.; John Meeks, vice-pres. and K9HPX, secy.-treas. BDG has moved to South Bend. K9ELE reports KRN and MRL as new Cond. Cl. licensees in Winslow. K9AYI has received his WAS certificate. K9CWG has moved to Kokomo. We need a new EC for Jefferson Co. as QOT is now K7ESS in Arizona. K9AUE is getting out well with a new 280-ft.-long wire. RTH reports K9DZS as a new Tech. Cl. licensee at Seymour. RE has gone s.s.b. with a new HT-32. The S.S.B. Net should be well organized by the time this is printed. Check with KOY or MEK for details. SWD reports evening IFN traffic as 244 and morning 79 for a total of 323. QIN traffic reported by JOZ was 194. TT reports a traffic count of 58 for RFN. Those making BPL were K9CLU. W9NZZ and VAY. Traffic: (Sept.) W9NZZ 818, VAY 666, K9CLU 443. GBB 273, W9JOZ 128, ETM 104, ZYK 98, TT 97, SWD 79, TQC 76, SNQ 75, K9AYI 63, W9PKJ 28, W9PKJ 59, RTH 47, UQP 45, K9HGF 40, W9GJS 33, K9IXD 33, W9BKJ 26, EJW 26, WID 26, BUQ 25, FJR 25, K9JKK 19, W9DOK 18, CC 16, K9ELE 16, W9IMT 16, MHP 16, YYX 15, K9HOI 14, W9RDP 13, K9BSU 13, W9IKI 29, W9DOK 5, W9HGF 40, W9GJS 33, K9IXD 33, W9BKJ 26, EJW 26, WID 26, BUQ 25



is active again with a new 60-ft tower and a Triband beam, K9AEQ received a well-earned A-1 Operator beam, K9AEQ received a well-earned A-1 Operator certificate and together with K9ELT keeps WIN operations running smoothly with a high level of activity. K9EVB work KR6LP to complete his WAC. IKY, now settled at the new QTH, stepped up his activity on both the phone and c.w. nets, RACES and managing the Brown County Emergency Net. QJW advises that K9CJN/9 operated from Rib Mt. during the V.H.F. Contest and had 13 contacts in 2 states with 100 watts and a two-element beam. Operators were K9CJN V9. Contest and had 13 contacts in 2 states with 100 watts and a two-element beam. Operators were K9CJN, K9-GSE, K9DOP, QJW and VE2DQB/9. Officers of the newly-formed Waupaca Amateur Radio Club are DPN, pres.; KN9MAS, vice-pres.; KXK, secy.-treas. K9JQV handles the club's activities. There are 16 members and meetings are held the 1st Wed, of each month. KXK received a certificate from the Wireless Institute of Australia for being winner of last year's VK/ZL DX Contest in the W9 Area. Paul now has a DX record of 216 worked and 208 confirmed. CIZ, DPN and VWX are on 2 meters and monitor the band every hour on the hour. OT has now moved to W6-Land permanently. A new Wisconsin club listing is now available from the SCM. The Rufus King High School Club, W9KQY, now is up to 37 countries confirmed and is waiting for an Idaho card for WAS, EPO is trustee and operators include K9s EEO, EEV, KBE and KN9s LWS, OVI and OZG.

#### WISCONSIN OSO PARTY

December 7

All Wisconsin amateurs are invited to take part in a QSO party, sponsored by the Mil-waukee Radio Amateurs' Club in order to promote friendship and operating ability within the

Rules: 1) The party will begin at 10:00 A.M. CST and end at 5.00 p.m. CST Sunday, December 7. 2) All types of emission and all bands may be used, but a station may be worked only once regardless of mode or band. C.w.-to-phone operation is permitted but crossband work is not allowed. Stations are urged to work all bands from 2 through 160 meters to raise their scores. from 2 through 160 meters to raise their scores. A station may compete on c.w. or phone or both, as desired. 3) The general call will be "CQ Wis." 4) Information to be exchanged during contact will consist of a QSO number, RS or RST report, county, operator's name and time of contact. 5) Logs should show times, station worked, signal reports sent and received, frequency, time emission, power input, QSO numbers sent and received, name, county. It is suggested that sheets from the ARRL Log Book be used for convenience and accuracy. Exbe used for convenience and accuracy. Exchanges must be entered correctly. 6) Scoring: Count one point for such information sent and one point for such information received, for a maximum of two points per contact. Multiply the total contact points by the number of different Wisconsin counties worked for first the total contact points by the number of different Wisconsin counties worked for final score, only contacts with other Wisconsin amateurs can be counted. 7) A traveling trophy will be awarded to the highest scorer, regardless of whether that score has been made completely on c.w., or phone, or is a composite of both. Awards will be issued to the first, second, and third place winners using c.w. and phone phone. Awards will be issued to the first, second, and third place winners using c.w. and phone, phone only, c.w. only, Novice and mobile. Awards will be presented at a future MRAC meeting. 8) A self-addressed stamped envelope to K9CJK will bring contest forms. Send logs, posmarked not later than January 7, 1959, to im Buth, K9CJK, 2829 N. Weil St., Milwaukee 12, Wis. Judgments of the committee, consisting of W9s DYG QYW YZG and K9s ENB CJK, will be final. See how many Badgers you can work during the seven-hour contest period. Get on the air December 7 and meet the gang!

December 7 and meet the gang!

K6LWB/9 now is K9PKQ at Baraboo, OO K9HIZ has a new Triband quad on a 50-ft, stick, WSSN now has 13 regulars in 12 cities for good coverage, DYG now is up to 206 worked and 191 confirmed, K9CAN is on 2 meters with c.d. work and has WAZ along with his Dad, GIL, Traffic: (Sept.) W9CXY 882, SAA 180, DYG 139, KQB 114, K9ELT 69, AEQ 37, W9UFV 24, CBE 17, NRP 17, K9GDF 12, LMX 11, W9OT 11, K9GSC 10, W9QJW 10, MWQ 9, GFL 8, VHP 8, OVO 6, K9IQO 4, W9VIK 4, K9ALP 2, (Aug.) W9OT 6.

#### DAKOTA DIVISION

DAKOTA-SCM, Harold A. Wengel,

Wöhlva—SEC: Köjluw, Pam: YCL, RM: KöCNC. North Dakota 75-Meter Phone Net NCSs include YCL, KöCNC, GRM, AZX, IAB and JLW, Among the North Dakota hams who attended the Dakota Division Convention at Sioux Falls, So. Dak., were KöcNC, ESO, GRM, HDA, PZN, WöbeZ, DMJ, HVA, YCL and GWH. KöhlDa came home with the second prize, and Eldico S.S.B. mobile transmitter. KöCNC took his Extra Class exam, and now holds an Extra Class amateur license. The North Dakota C.W. Net again is in session; meeting every Mon., Wed. and Fr. at 6:30 P.M. on 3070 ke. Don't forget to pass along your news items to me I can't put them in QST unless I get them. Traffic: WöYCL 35, KöCNC 32, JLW 22, ADI 16, MHD 6, GRM 5, Wölftn 3, KögNC 32, JLW 22, ADI 16, MHD 6, GRM 5, Wölftn 3, KögNC 32, JLW 22, ADI 16, MHD 6, GRM 5, Wölftn 3, KögNC 32, JLW 22, ADI 16, MHD 6, GRM 5, Wölftn 3, KögNC 62, Hold 16, Ky S. SOUTH DAKOTA—SCM, Les Price, WöfLP—Asst. SCM. Gerald F. Lee, §YLKY. SCM assistants; FKE and NEO. SECS: YOB and GDE. PAM: SCT. RM: GWS. The S. D. 75-Meter Phone Net, which meets daily at 6:30 P.M. CST, plus Sundays at 9:30 A.M. CST on 3576 ke., reports 33 sessions; QNI 735, high 34, low 7, average 24:60; QTC 74, high 5, low 0, average 2.24; informals 81, lugh 7, low 0, average 2.45. The nets need more outbackell, Brooder City Pierre, Yamkton, Sioux Falls, Michell, Brooder City Pierre, Yamkton, Sioux Falls, Michell, Brooder City Pierre, Yamkton, Sioux Falls, Judy 1, Judy 1, Judy 1, Judy 12, Judy 1, Jud

#### **DELTA DIVISION**

ARKANSAS—SCM, Ulmon M, Goings, W5ZZY—SEC: K5CIR. PAM: DYL. RM: SZJ. The Osceola Amateur Club had a communications booth set up at the Missispip County Fair and created a lot of interest through operating and traffic-handling. The portable emergency-power generator and various gear was on display. The club at Fayetteville is very active and has code practice 5 days per week and theory one day. The Razorback Net meets nightly at 8:30 on 29.000 kc. The Club at Paris is increasing in number. EC CEU (Continued on page 133)

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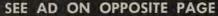


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reports 14 stations active in emergency drills, K5GRT has a new RME-4350 receiver. The club at Pine Bluff now meets at the AP&L Bldg, KGJ and K5VFX have appointed Asst. ECs for Seoastian Co. GUE is in college in Rolla, Mo. K5QYC is in college out of the State, ZZY built a new ham shack. We urge all Arkansas hams holding AREC appointments to check your certificates and send them in if endorsement is due, K5MAD and OYC (who are hypothesis recently received the Cap

tificates and send them in if endorsement is due. K5MAD and QYC (who are brothers) recently passed the General Class exam. Don't forget to support your local emergency and traffic nets. Traffic: W5BYJ 72, SZJ 62, K5HYD 43, W5CEU 23, ZZY 20, W7BED/5 7, W5IA1 4, K5GRT 3, W5UED 3.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—K5ANN, of Crowley, has been selected to fill the position of EC in place of K5EAX, who passed away in August. K5ABD boasts a gas generator for emergency power. SPZ has been transferred back to New Orieans after a two-year tour of duty at Ft. Worth. A new radio club, the Ozone Belt Amateur Radio Club, has been formed at Slidell with 12 members and a 300-watt club transmitter complete with emergency power. Officers are ANA, pres.; K5CVK, vice-pres.; FSA, secy,-treas. VSR reports that after two years in an apartment he is now in his mitter complete with emergency power. Officers are ANA, pres.; K5CVK, vice-pres.; FSA, secy,-treas. VSR reports that after two years in an apartment he is now in his own QTH and back on the air on 40-meter s.s.b. K5LVB put up a new beam and is working lots of DX. K5LHP now has a Viking II. MXQ, who retired in October after umpteen years with NOPSI, is busy keeping skeds with LAN, RN5, MARS and any other net that will pass him traffic. K5LKC reports that a new club has been organized called the Ark-La-Tex Amateur Radio Club with K5LKC, pres.; K5EGD, vice-pres.; K5DZT secy-treas; K5PMD, act. chairman. New hams in Shreveport include K5SBF, who is running a Viking II; K5SFG, with an Elmac AF67; K5SJJ, running a very potent 2-watt mobile, and K5RKH with a Globe Scout. KØBBH is operating portable in Bossier City. K5EMJ is working on a portable rig. The Nitwit Net gathering was a huge success. CEZ is fighting grass and nets while working on converting a BC-625 for 6-meter use. A newsy letter was received from KTD. Martin has 22 states confirmed on 2 meters. His rig on 2 runs 250 watts. 4X150 final, 40-element beam (4 tenelement Yagis). The receiver is a 416B preamplifier to a 417-417A crystal converter. Traffic: W5CEZ 461, MXS 194, K5LKC 24.

MISSISSIPPI—SCM, John Adrian Houston, sr., WSEHH—K5HYO, DLN and EEC displayed amateur radio equipment at the Bolivar County Fair in September. K5HPV has succeeded in getting his 75-meter W5EHH—K5HYO, DLN and EEC displayed amateuradio equipment at the Bolivar County Fair in September, K5HPV has succeeded in getting his 75-meter doublet to load, K5LEA has been working much DX on 15 meters. One of his V7ODs has burned out now. K5HYO has been modulating with one 5514 burned out, K5HYO has been modulating with one 5514 burned out, R5HYO has been modulating with one 5514 burned out, R6HYO has been modulating with one 5514 burned out, R6HYO has been modulating with one 5814 burned out, R7 recently dropped the "N" in their calls and are heard on 75- and 20-meter phone. GUU is State Army MARS director. He visits with A.F. MARS frequently on Mon. nights at Greenville A.F.B. EHH is in the process of building a new mobile rig and hopes to be working you fellows mobile soon. Traffic: W5TIR 21, K5GRV 9, W5RIM 8.

TENNESSEE—SCM. R. W. Ingraham, W4UIO—SEC: RRV. RM: NHT. PAMS: VQE, UOT, PAH and ZZ. Welcome to VJ, back from Europe. We are sorry to hear that PL is ill and hope for the best. We sure will miss Ben's traffic report. Thanks to VQE, PFP, PAH, NHT and K4JNK for net reports. Best wishes to the Teen-Age Net with K4JNK as manager. ZZ would like some volunteers as NCS for the 6-meter net in the middle of the State. K4SWI reports on plans for a 300-x5t amplifier to he deigne DV 40 Howevels.

the Teen-Age Net with K4JNK as manager. ZZ would like some volunteers as NCS for the 6-meter net in the middle of the State. K4SWI reports on plans for a 300-watt amplifier to be driven by his new DX-40. Honorable mention goes to K4KYO for OO reports, K4KYL for OES reports and 5RCF for the BPL award. Traffic: W5RCF 787, W4PL 416, OGG 124, K4LLB 58, JNK 43, W4IGW 35, PFP 32, VJ 30, NHT 25, PAH 15, UIO 15, ZZ 15, K4KYO 13, W4VQE 12, DTI 10, RRV 10, CXY 8, K4KYO 13, W4VQE 12, DTI 10, RRV 10, CXY 8,

#### GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst. SCM: William C. Alcock, 4CDA, SEC: JSH, RM: K4AIS, PAMs: OGY and K4MMW, S.S.B, PAMs: NGN and K4HBF, V.H.F. PAM: K4LOA, Thanks to CDA, who has agreed to serve as Asst. SCM. Al will continue to publish the bulletin and act as my adviser, Everyone is certain to miss OGY who is leaving the State. He did an FB job on KPN. OGY reports NCS and liaison stations are needed. BEI, W8LKA, K4QCR and SZA/4 are new members of the KPN. KSN has picked up with NGN, K4KYZ, EMR, HBF and BGP as NCS. K4LOA asks everyone to listen for KY6M Tue. and Thurs. at 1930 and Sun. at 0800 CST on 50.57 Mc. Hanks says eastern v.h.f. activity is needed. Good luck to ELG, GTC and K4CSH, new OBSs. K4KIL will be off the air for the (Continued on page 140)

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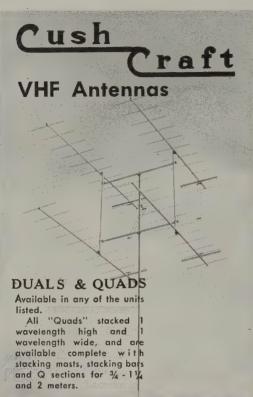
winter, K4KIS has an SB-10 for his DX-100. K4BUB sent an FB OO report, K4KIN now is on s.s.b. MWX was the proud winner of the Drake receiver at the Lexington Hamfest, OGY is working on a mobile rig. SZL has entered Baptist Seminary at Louisville. Dan also is on s.s.b. K4QHZ made WAS in three months, K4OAH will be working for BPL in the coming months, JSH will be on 6 and 2 meters soon. KKG has a new HT-32 and a 75A-4. K4LHQ has five new antennas, KKW's son Ralph has entered the Air Force and will be stationed in England, OES K4SPJ is building a 220 transceiver. Traffic: W4ZDB 284, K4AIS 123, W4GTC 93, SUD 87, OGY 77, K4CSH 69, OAH 69, W4RPF 68, K4MMW 61, W4JCN 52, KKG 43, K4KIN 39, W4KKW 39, NGN 34, ELG 30, K4LHQ 24, HBF 20, KIS 18, W4MWX 17, CDA 13, K4KIL 10, W4YYI 10, K4BGP 7, W4HNI 7, JSH 7, K4KYZ 5, EMR 4, HOE 3, W4SZB 3, SZL 3.

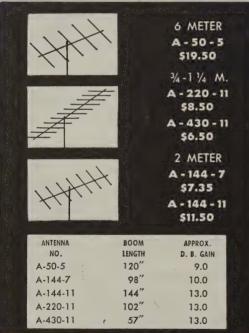
13, K4KIL 10, W4YYI 10, K4BGP 7, W4HNI 7, JSH 7, K4KYZ 5, EMR 4, HOE 3, W48ZB 3, SZL 3.

MICHIGAN—SCM, Thomas G. Mitchell, W8RAE—SEC: YAN. RMs: DAP, FWQ and OCC. New appointments during September included JXX as EC Macomb County; SLV as EC Livingston County. QQO managed to lead the pack with his traffic total despite being very active on a very busy TVI committee as well as heading up a growing AREC group. FX is working on 1920-vintage gear for the Ford and Michigan museums. That seems to explain why his car trunk was so loaded with antique components at the QMN pienic. SCS has a new Triband beam supported 60 feet in the air and has high plans for some winter operating now that the power company has cleaned up the noise from the high line constructed just after he bought the QTH. We have lost two good brothers who have moved to other parts of the country. Ex-SCM, DLZ, moved to the State of Washington and DJN moved to Florida. Both of these fellows have contributed much to our Michigan activities and I'm sure that all of the gang join in wishing them both the best of luck at their new QTHs. The Motor City Radio Club has elected the following officers: QFM, pres.; SSO, vice-pres.; NBF, treas.; and CZP, seev, New officers of the Blossomland Amateur Radio Assn. are QQO, pres.; K9LAP, vice-pres.; QOT, seev.; L. Dettman, treas.; and IEV, act. mgr. The "Brass Pounders" (Pt. Huron) elected BDI, pres.; WMN, vice-pres.; AZC, seev.-treas.; and FWQ program chmn. #DWC visited the gang in Southwestern Michigan and gave a very interesting discourse on S.A.C. communications and operation. His comments were heard program chnn. 6DWC visited the gang in Southwestern Michigan and gave a very interesting discourse on S.A.C. communications and operation. His comments were heard by two hundred hams from the Michiana Area at a meeting sponsored by the Heath Co. Radio Club. The Berrien County AREC units provided emergency communications in Hartford during a communications "blackout" resulting from a severe storm early in the month. Their mobile and fixed relay stations provided communications until commercial circuits were restored. Much was gained and preparedness paid off. Traffic: (Sept.) W8QQO 151, FWQ 146, OCC 111, FX 68, ILP 44, K8NAY 44, HVQ 26, W8YAN 24, DJN 23, JKX 20, WXO 16, AHV 15, VYG 13, K8CKD 12, W8NOH 11, K8ABW 8, W8FOV 8, SCW 7, AUD 2, EGI 2, HKT 2. (Aug.) W8SCW 10.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: UPB. RMs: DAE and VTP. PAMs: HPP, HUX and HZJ. K8s HDO, KRD, GVG, HSU and HRX received their General Class tickets. The Greater Cincinnati ARA's Stag Hamfest was the largest yet with nearly 1100 amateurs attending. K8ECJ won the Central Electronics 100V and K4BQA won the beam, tower and rotator, SPF, our Great Lakes Division Director, and Carty, our SEC, were there. Some of the Hamfest's highlights were a model aeroplane show, an antique auto show and the U. S. Marine Corps Reserve Communications Unit demonstration of radiotele-Some of the Hamfest's highlights were a model aeroplane show, an antique auto show and the U. S. Marine Corps Reserve Communications Unit demonstration of radiotele-type and field station vans. JDN went on the N.R.O.T.C. summer training cruise. K8CZJ is a freshman at Case Institute. The Ohio State Highway Patrol appealed to the Cuyahoga County AREC to furnish communications in the hunt for a lost child and AEU, LHX, QLB, QXG, TFW, K8s BYI, CDA, DHX, DJC, GJW and JHZ took part. Your SCM attended the Findlay Hamfest along with more than 250 amateurs and their families, CBT won the SC-101. The Springfield ARC's Q-5 tells us the members have a well-attended code class and furnished communications at a golf club tournament with BFP, DCJ, JRG, OKB and WXG taking part. CSA is now KIDXW. The Worthington High School Organization of Amateurs was formed with K8GUV, pres.; and ABM, RTF and TOO, advisors, and has a new DX-40 and an NC-183D in its club station. KN8s LAW, LBZ, LCQ, LEH, LEZ, KYO, MAF, MAG and MBC are new hams. The Kenton ARC had a weiner roast and has started a General code class. K8EKG is attending U. of Akron. Ohio Valley ARA's Ether Waves reports UOD is the proud papa of a baby girl, EZF has a new three-element Triband beam and plans are being made for another DXpedition, Toledo's Shack Gossip names OTK as its "Ham of the Month," and reports that K8GIW vaca-(Continued on page 142)







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tioned in Massachusetts, K8IIL vacationed in Kansas and SDZ is in the Air Force, K8JMF is in a hospital and it would be nice if you would write to him at Box 672, Stow, Ohio. I know the "King Fish" would appreciate the letters or cards or get into the "King Fish Nets" on 7275 kc, at 1000 EST or 7085 kc, at 2200 EST. The Lake Geauga RC held a hidden transmitter hunt, Winners were RBC and UXB with IMH, SZU, HAE, GQO, SSI, CFX, SRU, RCG and QLJ taking part. K8COI received WAS (Worked All Sadlers) and POOS certificates, GFE has a new quad. UPH is on s.s.b. with an HT-32. IBX received the DUF-1 award. Clermont County ARC held its Annual Picnic, IGE has a new Viking Ranger, YGR worked KX6, UC2 and UA9, FDR and AL received the W-Conn. Award and share the honor of being the first W8s to receive it. GFE and UPH made BPL in September. New appointments in September are OPA, K8DHJ and K8DKW as OOs and K8BDT as OES, IMW has a lawn-mower mobile on 6 meters. AQ vacationed touring the West, BUM vacationed a month in W6- and W7-Land, GUP has a new Johnson 500, K8BYC has a new 10-meter beam, OHP was married and is mobile. WNM is back on 2 meters, The Canton ARC and the Massillon ARC held a joint picnic with 42 amateurs and their families attending, K8DHJ won a J730 mike. K8EJN also won a mike and QJW won a Conclard receiver. Traffic: (Sept.) W8UPH 1156, AMH 241, GFE 183, DAE 118, VTP 118, HXB 88, OPU 81, LT 71, QLJ GHA, AL 48, K8ELJ 48, W8IBX 31, RO 27, K8DDZ 24, W8AAU 17, WE 12, K8DTZ 10, W8HPP/8 10, UCW 10, K8HDO 9, W8HZJ 9, YGR 8, BEW 7, QCU 5, K8DXZ 4, HEJ 4, HYJ 4, W8LMB 4, QIE 4, WYS 4, HYJ 3, STR 3, WTO 3, BLS 2, WAB 1, (Aug.) W8QLJ 195.

#### **HUDSON DIVISION**

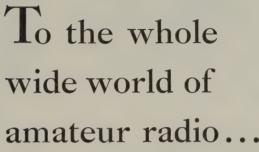
EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: W2PHX. PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900, NYSPTEN on 3925 kc. at 1800, IPN on 3980 kc. at 1530, ESS on 3590 kc. at 1800, ENY (ennerg.) on 29.490 and 145.35 Mc. Fri. at 2100, MHT (Novice) on 3716 kc. Sat. at 1300. Congrats to W2PHX who was married Sept. 27. Dick has moved from Yonkers to New City with plenty of antenna room. New appointments: K2CVG and K2-ZLX as OESs. Endorsed: W2RGC as SEC. The Pelham H.S. Club, K2OXR, is on the air with 50 watts and a Super-Pro with long wire. The Albany Club held Old Timers Nite Sept. 26. W2AKK will be more active with the new HQ-110, homework permitting. K2EDH worked for the Bureau of Standards in Colorado during the summer. Jon is now attending Swarthmore College. worked for the Bureau of Standards in Colorado during the summer. Jon is now attending Swarthmore College. K2YFI says the new cubical quad has exceeded his expectations. A new Novice in Westmere is WV2AZP. Net certificates for NYSPTEN were issued to W2FVP, K2-YZI and K2ZAU. The RPI Club, W2SZ, is active with traffic-handling and RACES Command Net activities. His many friends in E.N.Y. mourned the passing of W2SJV, former SCM of W.N.Y. Schneetady Co. EC W2WWK retires from G.E. this fall. Frank says Florida in winter and Scotia summers will keep him busy. W2GTI looked up hams while in Dallas early in Sentember looked up hams while in Dallas early in September. The Schenectady Club held a very successful auction at its Oct. 6 meeting. We wonder if the newer clubs are not

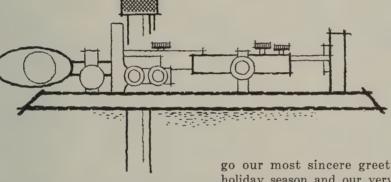
The Schenectady Club held a very successful auction at its Oct. 6 meeting. We wonder if the newer clubs are not overlooking the promotional possibilities offered by a simple news sheet. It's relatively inexpensive and keeps your members informed and interested in your club. Try it. Traffic: (Sept.). K2UTV 275, K2YTD 191, K2-YZI 147, K2VTW 61, W2EFU 52, K2UYK 52, W2ATA 46, K2QJL 31, W2SZ 23, WV2AKK 22, K2LKI 11, K2RKY 10, W2FVP 9, K2CKG 6, K2HJX 4, K2ZAU 3. (Aug.) W2PHX 95, K2QJL 34, K2RKY 11.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO, RM: W2-WFL. PAM: W2OBW. V.H.F. PAM: K2EQH. Section nets: NLI, 3630 kc, nightly at 1930 EST and Sat, and Sun, at 1915 EST. NYC-LIPN, 3908 kc, Mon, through Sat, from 1730 EST. V.H.F. Traffic Net, 145.8 Mc, Mon.-Wed.-Fri. at 2000 EST BPL cards were earned this month by W2KEB, W2JGV and K2PTS, the latter two on originations plus deliveries. Congratulations to K2-PTS, who joined the BPL ranks for the first time with his fine effort. K2QBW received his WAC and WBE certificates. K2LCM earned a CP-20 certificate. W2IVA, W2PF's son, returned to M.I.T. for his senior year. The U.H.F. Club of Jamaica, working as W2DYM/2 from Staten Island, contacted W3VIR on 432 Mc. A new son has joined the family at K2RJO. K2AAW increased his mobile power to 25 watts and is enjoying better contacts. K2QCS completed a new 2-meter receiver. A new "1" antenna is in use at W2EHA, W2IGH is on the air with a DX-100 and an SX-101. W2JCA vacactioned in VELand. W2MDM added panoramic equipment to the shack, K2OEG needs only North Dakota to complete (Continued on page 144)

(Continued on page 144)







W2LAL K9CLH W2NRE K6KII

W5ZNM K9KGI

W6HV W9CXL

W6MEG W9IDI

W6VNG W9JMD

W8MTZ W9NTI

W8NPO W9PXL

W9BAQ W9QYX

W9BBC W9URS

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THE AMERICAN RADIO RELAY LEAGUE, INC. West Hartford 7, Connecticut his WAS. W2AEE is using a 6N2 with Tecraft converters, K2KJV is handling traffic on 40-meter phone with a Globe Scout. W2LYH has built crystal-controlled converters for 10, 15 and 20 meters. W2RQG is moving to Orlando, Fla. New officers of the Chaminade HSRC are K2TIM, pres.; K2DTJ, vice-pres.; P. Conway, seey.; and KN2EXG, treas. The club station, W2JTZ, uses and Technicians. K2SVY is active on 6 meters with a T8S-50 and an S-38E with a Tecraft converter. K2QGA dropped the "N." The Levittown ARC visited W1AW and League Headquarters in mobile caravan style. A new member of the club is WV2AQE, known professionally as Jackie Jay, a TV and club comedian. K2YJC is on the air from his new QTH in Stony Brook. W2PRU is trying s.s.b. New officers of the Stuyvesant HSRC, W2CLE, are K2RDP, pres.; K2UMT, vice-pres.; and KN2KVL, seey. The club returned to the air with an HT-9 and an NC-98. New officers of the Long Island 6-Meter Emergency Net are K2VIX, net control, with K2RBS and K2RKL as alternates; K2RMA, act. mgr.; K2YBW, asst. act. mgr. K2DZA is the net's bulletin station and W2ACH acts as technical advisor. W2OBU is on the air with a new DX-100B. The W-Conn Award has been earned by K2RNV on c.w. and K2MHY on phone. W2TUK and W5ZRA/2 added a 75A-4 and a kw. linear to their shack. With the ice and snow once again with us, all mobileers are urged to use extra caution in driving. If your news item or traffic total has not appeared in this column, it will be included next month. Your SCM was called to Norfolk Va., on business for six weeks and this column was written on a week-end flight home. Traffic: (Sept.) W2KEB 3584, W2JGV 357, K2QBW 331, K2PTS 186, W2VDT 163, K2DEM 129, K2-KJV 92, W2DUS 72, K2LCM 23, W2EC 10, W2DBU 10, W2PF 10, K2RKL 9, K2RJO 7, K2AAW 6, K2TSE 6, W2HU 5, K2MEM 4, K2QZS 4, (Aug.) W2AEE 47, (July) W2AEE 32. (June) W2AEE 90.

# MIDWEST DIVISION

IOWA—SCM, Russell B, Marquis, WøBDR—The Des Moines Amateur Radio Assn. was host at the Midwest Division Convention Oct. 4 & 5. Mr. Dosland, ARRL President, and Mr. Huntoon, ARRL Asst. General Manager, were featured speakers. NWX, Midwest Division Director, sponsored the program for the Central Iowa Club meeting, General A. Najera, XEIH, was featured speaker, KøMMZ received an ORS appointment. Renewals: BLH and BQJ as ORSs and JDV as OBS. The Cedar Rapids Club held a hamfest Sept. 7 with 568 registered guests. The Bedford Club held a piemic Sept. 14 with 56 hams registered. The Creston Club and the Great Lakes Club also held their pienics the same day. UJC vacationed in the New England States. KøHC visited the State of Washington. KøKQD and his OM, of Alamosa, Colo., visited several Iowa hams, including BDR. The Northeast Iowa Radio Club had a station set up at the Dairy Cattle Congress in Waterloo under the call DVL and made BPL. KøEIY, formerly W9PJR and Iowa SCM, has joined Silent Keys. KøBPR has a new SX-101. MYJ is slated to join the armed services. KNø-RHI and RHH are new Novices in Belle Plaine. QVZ passed the General Class exam. Traffic: (Sept.) WøSCA 1603, BDR 1524, LGG 876, PZO 702, KøCLS 364. WøGXQ 270, DVL 185, NYX 131, QVA 113, KØMMZ 94, WØKVJ 86, KØIQB 72, MIB 72, JPJ 67, BLJ 54, LCX 54, WØGXQ 49, KØOWM 44, WØLJW 43, KØAUU 38, WØSCA 49, KØOWM 44, WØLJW 47, KØAUW 48, WØSCA 48, KØOWW 48, KØSW 48,

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approximately 60 ohms; delivers up to 10 watts RMS output into any low impedance load between 25 and 100 ohms. Powered by separate power supply or in some cases by transmitter or exciter such as 20A or 10B. Requires 300 volts at 100 ma dc, 150 volts negative bias and 6.3 volts at 1.5 amp filament. Size only 5x7x7 inches.

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BLI 473, FNS 292, QGG 128, IFR 118, KøIRL 114, WøFHT 62, ABJ 54, UOL 49, KøKMZ 44, WøSAF 37, KøBIX 36, WøSYZ 33, KøEFL 27, WøUTO 23, LEW 19, TTG 17, ORB 15, KøOCU 12, WøFDJ 10, VUI 9, LOW 1, MISSOURI—SCM, James W. Hooker, WøGEP—Net reports: (Aug.) MEN; 9 sessions reported; QNI 314, QTC 82; NCSs, OVV 2, VPQ 1, IZN 1, OHC 4, OMM 1, (Sept.) MEN; 12 sessions; QNI 379, QTC 98; NCSs, BUL 2, OMM 3, OHC 4, VPQ 3, MON; 52 sessions; QNI 234, QTC 167; NCSs, OUD 40, GBJ 5, RTW 4, PME 2, KøONK 1. CPI enjoyed a three-week vacation on the Gulf of Mexico. UXT has a Communicator on 2 meters with a 54-ft, tower and 5-over-5 beam. KøHHG has a new 10-meter beam. Three new Novices in West Plains are Knøs QKJ, QKK and QKM, KøKOB has a new WRL 755-A v.f.o, Knørin received an OES appointment. KøJPH bought an SX-28 after receiving his General Class license in August. KA made good use of his sideswiper with GEP's mobile on 80-meter c.w. while traveling to the Midwest Division Convention. KøONK is manager of the Handycaper Net, which meets on 7280 kc, at 0800 Mon., Wed. and Fri. and 0900 on Sat. HARC News states that 35.5 per cent of the hams in the Greater Kansas City Area have K calls. There are 23 sets of "twin calls" in the area. PME was the reporting representative of MON at the Midwest Division Convention. Your SCM was pleased to renew acquaintance with PME, SBY, SQB, GXP, NNM, KA, OIV, MNW, PMU, IGU and TBI at the convention. To the others of the Missouri gang, please excuse my memory and lax bookkeeping in not being able to list your calls. Traffic: (Sept.) WØCPT 517, KØONK 192, WØUXT 182, ARO 162, OUD 127, VPQ 104, KØHHG 92, KBD 90, WØKIK 87, BVL 53, RTW 52, GBJ 38, BUL 13, KØHY 12, CFY 6, WØKA 2, WAP 2, GEP 1, KØKOB 1. (Aug.) KØCFY 3.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—Your SCM attended the very fine Midwest Division

12. CFY 6, WøKA 2, WAP 2, GEP 1, KøKOB 1. (Aug.) KøCFY 3.

NEBRASKA—SCM, Charles E. McNeel, WøEXP—Your SCM attended the very fine Midwest Division Convention at Des Moines. The boys in Eastern Nebraska are doing a fine job on 10 meters, both mobile and fixed, for emergency work and c.d. The Western Nebraska Net report for September is QNI 576, QTC 76. This net operates on 3850 kc. daily at 0700 and all who can are invited to take part. NIK is NC. The Nebraska 75-Meter Emergency Net, on 3983 kc. daily at 1230 CST, reports QNI 477, QTC 40. As of Sept. 1 there were 31 stations on roll call. The Nebraska SS Net started off to a good start with 11 members and QNI 196, QTC 69. The Nebraska C.W. Net, on 3525 kc. daily at 1900 CST, reports QNI 255, QTC 75. The Nebraska Morning Phone Net, on 3980 kc. at 1730 daily with KøDGW as NC, reports QNI 614, QTC 168. The North Platte Picnic was held Sept. 21 with a good attendance and a good time reported by all. The Wheat Belt Club and the North Platte Club held a joint meeting in McCook on Sept. 12. Traffic: WøMAO 150, KøIJW 100, BDF 66, MQC 66, WøZJF 58, ZWG 57, NIK 50, KUA 43, OKO 41, FTQ 36, BOQ 23, KDW 23, ZOU 21, OCU 17, KøHKI 16, WøEGQ 10, SPK 8, URC 8, QKR 7, HOP 6, KøKOK 6, WøPUT 6, VZJ 6, MTI 5, VEA 5, VGH 5, KLB 4, ZWF 3, AFG 2, KøELU 2, KJP 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ—SEC: EOR. RM: KYQ. H.F. PAM: YBH. V.H.F. PAM: FHP. Traffic nets: CPN, Mon.-Sat. 1800, Sun. 1000 on 3880 kc.; CN, Mon.-Sat. 1800 and 2130 on 3640 kc.; CVN, Mon., Wed. and Fri. 2030 on 145.98 Mc.; CTN, Sun. 0900 on 3640 kc. KYQ advises that CN handled 325 messages, including 62 on the second session, during 26 sessions in September. K1BML's stacked "halos" attracted a lot of attention at the Providence Convention, K1CKZ has 16 states on 6 meters using a Communicator III and a three-element beam. YBH reports that CPN handled 215 messages during 30 sessions with an average daily attendance of 27. High QNI goes to K1BEN, K1AQB, W1FHP, W1DAV, K1ACC, W1V1Y, W1MWB and K1AQE. FEA is busy with school work. LIG and PTS handled an emergency call from a K7 to New Haven. OAX has moved to New Mexico. YOL has a new tower, FHP reports that CVN handled 20 messages during 12 sessions with an average of 7 stations per session. MHF and K1BWJ appeared on HHR's "Ham Shack" program over W1LI. RWS has moved to New Jersey. WHL advises that the Monday 6-Meter Net handled 20 messages during 5 sessions with an average of 18 stations per session. OPB is DXing on 15 meters. SFH entered the armed services, TYQ made 1031 QSOs while operating HV1CN. ZTT is an announcer at WPOP. Twenty members of the CQ ARC attended the Providence Convention. K1CRQ received the first W-Conn Award using only 6 and 2 meters. Nearly 100 hams attended a hamfest in Bethlehem Sept. 28. K1EEW won the 2-meter transmitter hunt and K1AOX won on 10 meters. KLK was presented with the W-Conn Award by the Meriden Jaycees Sept. 22. OBR has a new home
(Continued on page 148)

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  V/S/W/R 1.3/1 or better each
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- · Large diameter (.058 wall) special alloy, taperswaged elements, for minimum wind drag and excep-tional strength to weight ratio.
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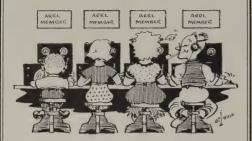
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made mobile transmitter and converter on 10 meters, 31FA is attending Taft school in Watertown, KIBHM passed the General Class exam. KIBEB is pleased with his new VR keying system on the DX-100. NUB and EWK work at WICC. New appointments: KLK as OFS; CDM and KHIJF as OOS, APA renewed his ORS and OPS appointments. Reports received: OES from KIBML, KICKZ, FVV, GTG, HQM, KLK, LGE, MWB and VWP; OO from KIAAE, KIAJJ, KIBEB, CDM, GIX, MBX and MWB, Traffic: (Sept.) KIAQB 528, BEN 356, WIYBH 284, KYQ 230, AW 220, ULY 116, TYQ 88, QJM 72, EFW 68, NJM 66, FYF 61, GVK 57, FHP 47, KLK 45, LV 37, MWB 36, RFJ 36, KIAQE 29, WIOBR 29, VIY 29, MDB 23, DHP 22, BDI 18, CUH 17, KIACC 16, WIGIX 16, AVS 12, CUH 12, KIBEB 9, WIEJH 9, KIBML 6, CKZ 5, AAE 4, WIHAT 4, ORP 4, YBI 4, KIAJJ 1, (Aug.) WIEFW 90.

MAINE—Acting SCM, Charles F. Lander, W1QJA—SEC: QJA, PAM: YYA, V.H.F. PAM: JMN. RM: EFR. Traffic nets: The Sea Gull Net meets on 3940 kc. Mon.-Sat. at 1700, the Pine Tree Net on 3596 kc. Mon.-Fri. at 1900, the Barnyard Net on 3596 kc. Mon.-Fri. at 1900, the Barnyard Net on 3596 kc. Mon.-Sat. at 1700 kc. Wiking Valiant and an NC-173 receiver in his new set-up. QIH has a new Apache transmitter. HHC is constructing his new studio "Z." The Hoss Traders Net is back in full swing Sun. at 1700 with K1AKO at the controls, Any who desire AREC information or forms, give a call or drop a line to QJA. RSC is back on 75 meters and is keeping Bar Harbor on the airwaves again, VYA, our PAM, is back on the mend. C.d. activity is increasing with the cooler weather. It is with the deepest and sincerest regret that we announce losing our capable and honored SCM, John Fearon, to W6-Land. The mantle of gloom shared by old-timers and Novices alike is only lifted by the complimentary messages on the nets and in QSOs that are being paid LKP for the quiet and masterful way in which he carried out his assignments, John was always there in a pinch and it was a rare occasion when he failed to be on the nets to handle the lion's share of traffic. We hope Glendale, Calif., appreciates and profits by his presence as much as the Maine section has, Send John a card and we may hear him on with a W6 annex. All NCSs will have his address. Best luck, John. Traffic: WIGPY 122, LKP 104, QJA 60, CEV 52, UDD 51, FV 50, KIDPM 20. DWQ 14, WIIZK 13, BX 12, KIBXI 10, WIHYD 8, KIBYE 6, WIOTQ 5, KIBAY 3.

Traffic: WIGPY 122, LRP 104, QJA 60, CEV 52, UDD 51, FV 50, K1DPM 20. DWQ 14. WIIZK 13, BX 12, K1BXI 10, W1HYD 8, K1BYE 6, W1OTQ 5, K1BAY 3.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—New appointments: K1CXN as OPS, EUJ as OES. BL, our State Radio Officer, has moved to Sudbury. Eastern Mass. was well represented at the Convention at Providence. The Merrimac Valley ARC is sponsoring a Mass, State QSO Party on Dec. 13-14. MUD has over 1000 QSOs on 2 meters. QKC is on 75 meters. KIIFQ is in Lynn. K1EKE is on 10 meters. JQA, K1GQZ, WTF and NMU are on 2 meters. Newcomers are welcome to check into our nets: Eastern Mass, C.W. Net on 3660 kc, at 1900 Mon. through Fri. and Mass. State Phone Net on 3870 kc, every day at 1800; also TCPN on 3970 kc, at 1700 each day. The Federation of Eastern Mass. Clubs met at JQ's QTH. The South Shore Club held a meeting. BGW has 198 countries and worked 2KH on RTTY. Don Wilson, 72 years young, is awaiting his KN1 call. The QRA had Mr. Roberts, of National Co., give a talk on receivers. DGN's son is KNIIRB on 7 Mc. KN1HRN is new in Foxboro. K1CEH is on 80-40-meter c.w. ETH has a 15-meter vertical. NTK has a Valiant and is working DX. DBY, LDT, UBC, K1BNA and KZB helped out in a hunt for a lost plane. K1BUR has a 65-ft. tower and a Triband beam. BW is all antennas and quad crazy. IGH moved to Milton. K1BBU is hot on 10-meter DX. UKO has a new dipole for 75 meters and a Heath-kit power and s.w.r. bridge. ADR, EC and RO, has a large active group for c.d. GYM is his Asst. RO. K1BYL has a new 50-watt rig. New calls in the New Pedford Area: KN14QD has a Globe Scout on 80, KN1HJD has General on 40 meters. WU has the masts up and is putting up a Sterba curtain. K1AH is portable in Providence. KYC got his HR-5 fixed for 10-15 meters. NJL joined the Waltham ARA. The 6-Meter Crossband Net is going fine, says AWA. KN1HNZ is new in Quincy. AJU/6 was here for a visit. KN1HQP is on 80 meters in Newton. DEL is in the Navy and across the pond. ORV now is in Arlington. ERN has his General Cla

as the night after an ELDICO Christmas...



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the Barnstable Oscillator was received. Sector 2-D's new 2-meter frequency is 147,325 kc. This is the old Sector 1-B with headquarters at Stoughton. NVV and ZXZ are heard on 2 meters. NF got his Sputnik No. 1 QSL card. EUJ is building a crystal converter for 432 Mc. KBN will be on 220 and 432 Mc. LMU's OBS and OES appointments were endorsed. CGU is working on a new house. PIW has TBS on 10 meters. GEF is working on his 1 kw. LUW moved to Boxboro. UG is going to New Orleans in his boat. UH has a new ground plane on 10 meters, LMU is trying s.g modulation 10 meters. AHE/1 was at York Beach, Me., in the V.H.F. Contest. Traffic: (Sept.) W1EMG 431, UKO 381, AWA 261, EAE 121, K1DGI 54, DIO 53. W1AUQ 47. MIX 35, KBN 31, K1BGI 64, DIO 53. W1AUQ 47. MIX 35, KBN 31, K1BGI 68, W1TY 8. WU 8. K1AII 6, DEY 6. W1KY 66, UE 6, NJL 5, AHP 4, EUJ 4, ALP 2, DTB 2, SMO 1. (Aug.) W1AWA 342, HGN 96, K1DGI 41, W1EPE 16, ATX 12, JBD 9, UE 8, AHP 6, DTB 2, SMO 2.

# MASSACHUSETTS OSO PARTY

December 13 and 14

The Merrimack Valley Amateur Radio Club announces a Massachusetts QSO party in which all amateurs are invited to participate. Details

follow.

follow.

1) The contest begins at 6 P.M. EST December 13 and ends at 11:59 P.M. EST December 14. 2) Suggested congregating frequencies are 3660, 3870, 7080, 7260 and 14,100 kc. 3) The same station may be worked for additional credit on more than one band. Phone and c.w. are considered separate contests. Stations may enter both but must submit separate entries. 4) General calls: "CQ MASS." Massachusetts c.w. stations identify themselves by signing "de enter both but must submit separate entries.
4) General calls: "CQ MASS." Massachusetts
c.w. stations identify themselves by signing "de
MASS (call) K." Phones say "Massachusetts
calling." 5) Contact information: Mass. stations
send QSO number, RS or RST and county.
Others send number of QSO, RS or RST and
state, province or country. 6) Scoring: Each
completed contact counts five points. Non-Mass.
amateurs will multiply by the number of Mass.
counties worked; Mass. stations will multiply
by total number of states, provinces and
countries worked. Multiply this total by 1.5 if
input power remains under 150 watts at all
times. 7) Certificates will be issued to the two
highest-scoring stations in each state, province,
country and county in Massachusetts. 8) Logs
must show the date, time, emission, and power
input as well as the required contact information. 9) Contest logs should be submitted to
Contest Chairman W1HKA, c/o MVARC, Box
21, Lawrence, Mass. postmarked not later than
December 31, 1958.

The Worked All Massachusetts Counties certificate (p. 62, September QST) will be issued
to those who succeed in working all 14 counties
during the contest, regardless of the type of
emission used.

during the contest, regardless of the type of

emission used.

WESTERN MASSACHUSETTS—SCM, Osborne R. McKeraghan, WiHRV—RM: BVR. PAM: MNG. Net times are West Mass. C.W. Net at 1900 EST and the Mass. Phone Net at 1800 EST on 3870 kc. ORS appointments have been endorsed for EOB, DGL, DZV, FZY and KGJ. The Hampden County Assn. held an auction at its September meeting and had a swell turnout with a lot of fine gear changing hands. The Radio Club at the University of Mass. now has over 15 members and is growing. The station is well set up with a 75A-1 receiver, a Collins exciter with push-pull 813s final running 300 watts and a 6-meter rig and beam antenna. DGA reports a new high-voltage power supply completed and ready to run a 6-meter rig but school work at Lowell Tech. keeps him pretty busy. ZPB has been awarded a net certificate for IRN and reports a very active radio club at Mount Hermon School with 25 members and regular code and theory classes. EOB has upped his countries-worked total to 212 and has a new three-element beam for 20 meters. DGL is enjoying his new Tribander beam. The Podunk Radio Club had a bangup time at the Providence Convention, going as a group dressed as farners. RFU reports making 18 contacts in 11 sections on 220 Mc. during the September V.H.F. Contest. Your SCM, HRV, will complete his current term in November. I wish to thank all the section members for their fine cooperation and assistance. I have fully enjoyed the many fine contacts and friends made during the past four years. I am sure that your cooperation with our new SCM, DGL, will be greatly appreciated. (Continued on page 152)



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Traffie: W1UEQ 987, KGJ 150, DGL 119, DZV 72, BVR 65, EOB 40, CAU 38, TAY 26, ZPB 24, AGM 13, OSK 10, DGA 9, DAJ 7, FZY 6.

Traffic: W1UEQ 987, KGJ 150, DGL 119, DZV 72, BVR 65, EOB 40, CAU 38, TAY 20, ZPB 24, AGM 13, OSK 10, DGA 9, DAJ 7, FZY 6.

NEW HAMPSHIRE—SCM, John A. Knapp, W1AIJ—SEC: BXU. RMs: COC and KIBCS. PAM: CDX. V.H.F. PAM: TA. The GSPN Pienic held Sept. 28 at KVG's QTH, Mirror Lake, was a most enjoyable event with approximately 80 in attendance. The Concord Brasspounders, OC, held an outing at Sunapee State Park Sept. 14. Approximately 85, including members and their families, attended. FTZ was selected MARS operator of the month for July, for which he received a certificate in recognition of outstanding contribution in the 1st Army MARS program. JNC and AIJ attended the Hudson Division Convention at Albany Oct. 11 and 12. KIBCS was guest speaker at the Franklin Rotary Club Sept. 16. His subject: "What Amateur Radio Means To Your Community."

EVN reports interesting experiments with aluminum drainpipe antennas. Your SCM attended the New England Division Convention at Providence. Congrats to your new SCM, RMH. Good luck. Bob. My heartiest thanks to all for your splendid cooperation and assistance during my term as SCM. Season's Greetings to one and all. Traffic: (Sept.) KIBCS 295. CIF 88, W1HKA 80, QGU 67, MOI 35, KVG 24, EVN 15, AIJ 12, ENM 6. (Aug.) W1HKA 58.

RHODE ISLAND—SCM. Mrs. June R. Burkett. W1VXC—SEC: PAZ. PAMs: KCS and YRC. RMs: BBN and BTV. GZA has been appointed EC for Warwick. K1ABR and K1CRN are new OESs. Congratulations to UHE, who recently had successful contacts with Virginia and Pennsylvania on 432 Mc. The East Providence Amateur Radio Assn. (EPARA) held its annual election Oct. 10. Officers are OLO, pres.; PPN, vice-pres.; LCP, seev.; HLY treas.; and K1BDN, act. mgr. The BVARC sponsored a Fox Hunt on 10 and 6 meters on Oct. 5 and the trophy awards went to DOR and K1ICS. K1GGF passed his General Class exam in September. K1INS is active on 40 meters. You can earn a "Worked PRA certificate" by presenting a log showing contact with 25 PRA members to YLB or CJT. This award became effective for all conta

bers. Traffic: W1YAP 88, YRC 50, TGD 25, CMH 23, LSP 20, WED 10.

VERMONT—SCM. Mrs. Ann L. Chandler. W1OAK—SEC: EIB. RM: K1BGC. PAM: ZYZ. K1BOL is a new OPS. Following are GMN's net controls Mon. through Sat., respectively: K1BCS, ZYZ, ZEW, VSA, HRG and EIB. EXZ is enjoying a BC-312N receiver on 50 Mc. BXT, net manager of the 7-Mc. Mike Farad Net, reported traffic of 323 for September. A civil defense RACES meeting was held Oct. 5 at Montpelier to devise ways and means to better the RACES network. Keep an eye out for marine radio operator TLP/MM, who is operating on 21 Mc. from somewhere in the Pacific. ZEW has a new GPR-90. Congrats to K1BVH on the new YL harmonic! K1AUE now possesses both General and 1st-class commercial radiotelephone licenses. KN1HDB is enjoying his new Q-multiplier. KN1HKI is attending St. John's Seminary in Brighton, Mass. New BARC officers are TBG, pres.; WPJ, treas.; KN1HCZ, clerk; VSA, QQN and NLO, trustees. KN1GKL got married. K1CRF is being hospitalized at the Vet's Hospital in St. Johnsbury. K1CCR is mobile with a Gonset Triband. The following members of the Mike and Key Club of Middlebury are going v.h.f. on 144 Mc.; EIB, EIC, HFS and TFB. A statewide v.h.f. emergency network is much needed. K6KVY (ex-MLJ) from Barrey operates 14 through 28 Mc. Traffic: W1OAK 202, BXT 130, ZEW 90, KRV 61, K1BGC 25, W1AD 23, HRG 19, UWS 19, TXY 11, K1BOL 7, See page 154 for announcement of the 7th Vermont QSO Party.

# NORTHWESTERN DIVISION

ALASKA—SCM, Eugene N. Berato, KL7DZ—BMZ was very active on phone in September, AWR also was active with 243 contacts, 23 s.s.b. CDF reports 10 meters opened up north of the Arctic Circle on Sept. 10 with CMI and CDF active. CMI, CDF and CQL now have phone relaying arrangements to the different dew line sites. CQL will move to KP4-Land soon. BLL, AUV, COT and CAT are hot on RTTY, AMV is joining the 6-meter boys this winter. CDG has moved outside. The Eskimo Amateur Radio Society (EARS) has elected CNW, pres.; CTE, admn. vice-(Continued on page 154)

Froehliche Weihnachten

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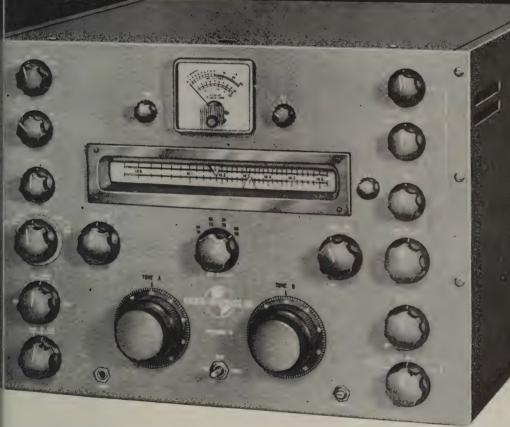
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Single 6146 output. · Built-in VOX and QT.

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# SEVENTH VERMONT QSO PARTY

December 12-14

The Tri-County Amateur Radio Club of Brattleboro, Vermont, announces the 7th Vermont QSO Party and invites all radio amateurs to participate. Vermonters are urged to work as many out-of-state stations as possible, so that interested amateurs can earn credit toward WAS, WANE and W-VT awards. Here are the details:

(1) Time: 48-hour week-end period from 6 P.M. EST Friday, December 12, to 6 P.M. EST Sunday, December 14.

(2) No time limit and no power restrictions.

(3) Scoring: Vermont stations: one point per contact and multiply total by the number of states, U. S. Possessions, Canadian provinces and foreign countries worked. Outside stations: five points for each Vermont station worked and multiply total by the number of counties in Vermont worked.

multiply total by the number of counties in Vermont worked.

(4) Credit for contacts with the same station on another band will be given in order to promote more activity on the higher bands.

(5) A certificate will be awarded to the highest-scoring station in each state, U. S. Possession, Canadian province and foreign country, and to the highest-scoring station in each Vermont county. In addition, a W-VT certificate will be sent to any station working 13 of Vermont's 14 counties, provided the station has not previously been issued this award. Party logs showing required data will be accepted in lieu of QSLs. of QSLs

(6) Approximate frequencies: 3520, 3855, 7050, 7240, 14,100, 14,240, 28,100, 28,550 kc. and the 50 and 144 Mc. bands. Use as many bands

as possible.

(7) General call: "CQ VT." Vermont c.w. amateurs should identify themselves by signing "de VT (call) K." Phones say, "Vermont calling."

(8) Contact information required: Vermont stations send number of QSO, RST or RS and county. All others send number of QSO, RST or RS report, and state, possession, province or

country.

(9) Logs and scores must be postmarked not later than February 1, 1959, and sent to Tri-County Amateur Radio Club, c/o Harold Bover, W1DAQ, 10 Stewart Place, Brattleboro, Verwert

Vermont Novices are urged to get into the fray. Also, amateurs in Bennington, Essex, Lamoille and Grand Isle Counties, please plan to be active. Everyone interested, mark your calendars now so you won't forget. Good luck!

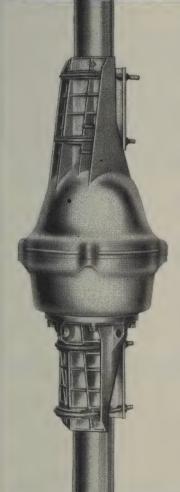
pres.; BRU, tech. vice-pres.; CRB, secy.; CQZ, treas. The EARS is on Fort Richardson. BHE and PIV have moved outside and plan to take on a foreign assignment. W4RCM/KLT is a new ORS in the Fairbanks Area. CUQ is on s.s.b. The Anchorage Amateur Radio Club had a successful equipment auction with a good turnout although the weather was bad. Traffic: (Sept.) KL7BJD 138, AWR 28, CDF 23, BMZ 17, BLL 5, CRE 3, CEJ 2. (Aug.) KG1DT 583.

IDAHO—SCM, Rev. Francis A. Peterson, W7RKI—Congratulations to JHY on being elected NCS and Net Manager for the FARM Net. Thanks to the fine job done by past officers. Reports were quite scarce this month. Did YOU send one in for your area? ZRC has moved to Weiser. VQC is working a lot of DX as well as handling the University traffic. The Pocatello Club got a bunch of surplus receivers from RACES and is hooking them up. CDA's XYL is now K7GCE. The Pocatello GGV Net handles traffic on 75 meters each morning at 8:15. While on vacation GCO crossed the corners of Nevada. Utah, and Arizona in contact with K4GLF and sent him three QSLs for his WAS. Director CPY visited the Pocatello Club meeting in October. WBK has moved to Rexburg. Check your neighboring hams to see if they belong to RACES and ARRL. Traffic: WTVQC 33, EEQ 27.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WXI—SEC: KUH. PAM: EOI. RM: KGJ. The Montana Phone Net meets Mon.-Wed.-Fri. at 1800 MST on 3910 kc. OHH has a new baby boy. K7CC2 has a new baby girl. ED travelled in Europe and attended the World's Fair in Brussels. FDH/LWR is in Beirut, Lebanon, as field engineer for RCA. K7EWZ, ex-8ARO is a new call at Plains. UZN is going to school at Tucson, Ariz. K7BPF moved from Plentywood to (Continued on page 156)

# "HAM-M" BY CDR

America's most popular ham antenna rotor



# Preferred because:

# **EXTRA HEAVY-DUTY**

Holds heaviest commercial arrays — ice-proof, wind-proof, moisture-proof!

# WON'T DRIFT

Provides 3500 in.-lb. resistance to lateral thrust.

# **EASIEST TO INSTALL**

It's complete! Mounts on shaft or flat on plate in 30-minutes.

**CONTROL CABINET:** Pin-point calibrated in 5° units. Needle operates without activating rotor. Built for 8-wire cable.

ROTOR MECHANISM streamlined to resist moisture, "icelock." Actually stronger than your antenna itself. 98 ball bearings for smooth action. Positive brake ends drift.



YOU CAN'T AFFORD LESS! WHY PAY MORE? In only a few months the new CDR "Ham-M" Rotor has become the "pet" of hams from Coast to Coast. Costs less than rotors that won't give you any better performance, won't hold heavier antennae, won't give you any more resistance to the elements. It's the complete rotational system—no extras to buy. At your distributor's: only \$119.50!



EXCLUSIVE OFFER: CDR "CALL-LETTERS" JEWELRY FREE! Handsome rhodium-finish tiebar and key chain, both with your call-letters engraved FREE with your purchase of the "HAM-M". Both bear amateur radio emblem. Just examine the "HAM-M" and get both for only \$3.60 (tax included) a \$7.20 value for half price. See your CDR distributor for details.

# CDR HAM ANTENNA ROTOR Cornell-Dubilier Electric Corp., South Plainfield, N. J. The Radiart Corporation, Indianapolis, Ind.



dipole adjusted for per-fect match to 450 ohm low-loss open wire lines. \$9.95

VHF VERTICAL

new decoupling sies principal makes possible low SWR 14 wave re-sonance maintaining efsonaire maintaining efficient operation for the 2 and 6 meter bands. Overall height 5' 52 ohm cosx feed. Net weight; 24 oz. Complete with 2 band tubing ground plane and mylon base insulator assembly.

\$16.95

Phone And The Complete RYan 1-6683 SYcamore 3-1196 Hy-Gain Line At

RADIO, INC. 1759 E. COLORADO PASADENA, CALIFORNIA

Mort Complete Line of Ham Gear"

Rock Springs, Wyo. FTO built a new ham shack and is back on the air from his home station after an absence of 3½ years. ENO has a new SX-101. VLZ has a new 75A-4 and a KWS-1, KTBND and KTCZQ have a new Apache. ZCO has a new Apache. K7AZH got two deer with a bow and arrow. New officers of the Central Montana Radio Club are HFZ, pres.; FTO and WSE, vice-pres.; QYA, seey.-treas.; and NXZ, training officer. New officers of the Harlo Radio Club are K7AZH, pres.; YTG, vice-pres.; TGM, seey.-treas.; and NPV, act. mgr. Traffic: K7BYC 61, EWZ 31, W7SFK 17, EKB 11, DEO 9, K7BVO 5, BON 3, WTCQC 3, NPV 3, K7DVZ 2, WTEWR 1.

31, W7SFK 17, EKB 11, DEO 9, K7BVO 5, BON 3, W7CQC 3, NPV 3, K7DVZ 2, W7EWR 1.

OREGON—SCM, Hubert R. McNally, W7JDX—Things are picking up on OSN with three new members, BDU, ZB and K7AZB. OSN is looking for a liaison station on OEN, someone who can work c.w. and contact OSN for traffic. K7ABX is quite active in the Tillamook Area with a nice station layout. PQJ is back at the old stand as OO with a fine report. YKT finally come up for air, Hope you will become active again, Dave. WNV has a new 55-ft. vertical for all bands and should be making a lot of noise soon. GWB still is very active on 6 meters with AREC and RACES. RACES has been issuing some new gear around Portland for c.d. work and several of the gang have new mobile outfits, including GLZ. The C.D. Net meets regularly each Sun. at 1900. The Council of Radio Clubs in Portland is making plans for a National Convention in 1962 which will conform to the building of the new ER Center in Portland; also plans are being worked on for a meeting place for all ham clubs. The Columbia River V.H.F. Society has been formed with RGS as pres. and GLZ as seey. This is a 6-meter club with quite a few members and is showing a good form of activity. A good score was made from the top of Mt. Scott in the V.H.F. Contest. Your SCM would like news from phone members as nothing was received for the month of September. Traffic: WTLT 87, ZFH 56, AJN 29, BDU 28, BVH 28, OMO 24, ALG 19.

WASHINGTON—SCM, Robert B, Thurston, W7PGY—New officers of the Cascade Radio, Club of Expertice.

nothing was received for the month of September. Traffic: WTLT 87, ZFH 56, AJN 29, BDU 28, BVH 28, OMO 24, ALG 19.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—New officers of the Cascade Radio Club of Everett are DKV, pres.; PTX, vice-pres.; BLS, treas.; PRY, secy.; BLX, EIK, PSY, CSK and PZC, trustees, KN7GCK is a new Novice from the Seattle Area. The Washington Amateur Radio Traffic System's (WARTS) new net time is 1800 PST Mon. through Sat. (3970 kc.), Ex-W7CJO now is signing KL7CVI. NMF is building mobile for a new car. HDT is mighty happy with the new HRO-60, ETD is planning a new cubicle quad for 15 meters. HLC now is located near Medical Lake. LVB is back from vacation and sporting a new Ranger. BXH lost his antenna in a wind storm. CWN is thinking of going on 6 meters and also hopes to get mobile in the car for 10 meters. FIX reports his activity is mostly with MARS and PANN with lots of listening. GSP is working on an all-band transmitter, EQU reports five drills were held in the Spokane Area during the month. JEY is very QRL teaching. AIB says his new tower, beam and rotator are already for assembly when he comes back from vacation. WN7EML now is General Class, K7fEL turned in his Technician's ticket on General Class, K7fEL turned in his Technician's ticket on General Class, K7fEL has a new Viking Ranger, W7LHL is on 2-meter s.s.b. ETX joined the ranks of Silent Keys Sept. 4. FD now is working for the Seattle Radio Supply. BA is slacking off on traffic. New or renewed appointments went to AVM as EC, GSP and JWE as OPSs, FQD as ORS, YFO holds skeds with his son, who is KR610 on Okinawa, WN7BFI has a new 40-ft, tower, NNF has a new Johnson 500. HNT, ex-MARS operator from K7FAE, now is stationed in Spain and planning on a DX-pedition. The North Seattle Amateur Radio Club now meets in new quarters at Shearwater Community Hall. ROH is moving to Centralia AMC. VKZ and ZEQ joined the Navy. HLM moved to Utah. PN has a new receiver. PGY is building a new converter with AFSK for 2-meter RTTY. Officers of the Low urged to check the expiration date on their appointments and to renew same if expired, IEU reports the new c.w. net on 3700 kc. is off to a good start, Traffic: (Sept.) W7BA 1211, PGY 696, QLH 353, DZX 250, APS 110, EHH 44, AMC 42, AIB 39, IEU 24, NWP 20, LFA 16, UWT 12, LVB 5, JC 4, GSP 3, CWN 2, JEY 1, (Aug.) W7WQD 21.

# PACIFIC DIVISION

NEVADA—SCM, C. A. Rhines, W7VIU—SEC; W7JU. Glad to be your new SCM and hope to meet many of you in person and on the air. I want to get a Nevada State Net going and would like to hear from all interested with suggestions. The latest (Continued on page 158)



# SINGLE SIDEBAND MINIATURIZED 50 WATT TRANSMITTER

41/8" x 11 - 1/8" x 71/4"

# Model SBT for Fixed or Mobile Use



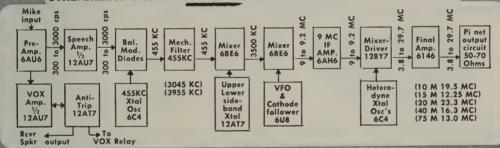
Coverage: 3.8-4.0, 7.1-7.3, 14.1-14.3, 21.200-21.400, 28.5-28.7 MC.

Calibration: VFO Calibrated, 0-200 Kc (add to frequency shown on band switch).

Filter: Uses a Mechanical Filter for Long Term Maximum Suppression of Unwanted Sideband.

Emission: Upper or Lower Sideband. CW-AM (SSB with Carrier Added).

# STREAMLINE DESIGN PROVES MONTHS OF MORROW RESEARCH



- Change bands, set drive and peak final, null carrier in about 30 seconds.
- Excellent voice-operated control system (VOX). Anti-trip of new, improved design, plus push-to-talk.
- Semi-automatic loading when changing bands
   —designed for 50-70 ohms.
- Antenna (VOX) relay built in.

- By changing plugs in the universal power supply unit, the SBT operates as an exciter at about 10 watts output, or as a barefoot transmitter at about 50 watts output.
- Controls grouped for ease of operation.
- Same cabinet dimensions as MB6 and MB565: 4½" x 11½" x 7½".
- Plug-in connections for easy removal from car.

NEW

12-Volt DC, 115-Volt AC, Universal Power Supply Unit designed especially for the SBT Transmitter includes complete set of power cables for either home or mobile use.

Amateur net.....\$124.50

AVAILABLE IN FEBRUARY, 1959.....NET

,\$34950

FOR FURTHER INFORMATION on the SBT Transmitter, see your dealer or write to:

**MORROW** 

radio manufacturing company

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Salem, Oregon





### 32S-1 TRANSMITTER

175 Watts PEP Input • 80 through 10 meters 10 db RF Feedback
Automatic Load Control • Upper and Lower SSB, CW 67%" H, 141/2" W, 12" D

Net Price..... ..... \$590.00



### 75S-1 RECEIVER

Sensitivity — 1 uv for 10 db S/N Upper and Lower SSB, AM, CW Broad Position for AM Crystal Calibrator 2.1 (furnished) and .5 kc Mechanical Filter 67/8" H, 141/2" W, 115/8" D

\$495.00



# 30S-1 LINEAR AMPLIFIER

(Coming Soon) Maximum legal power on SSB 1 kw input on CW ALC voltage fed back to 32S-1 or KWM-1 RF feedback for excellent linearity Self contained unit, with power supply in lower part of floor mounted cabinet.

Complete line of all Collins equipment and accessories. Trade-ins, time payment plan. Place your order now for early delivery.

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NIAGARA RADIO & PARTS CO. 1412 Main St., NIAGARA FALLS, N. Y. Call Book shows 377 licensees in Nevada. How many are ARRL? We have 28 AREC members and could use more. We need ECs. Write if interested. Address me at Box 1025, Elko. JU still is holding weekly 144-Mc. skeds with the Coast. KOI has a new vertical. UPS may be transferred to Wendover. PEW transferred to Reno. VIU received the W-Conn Award, is awaiting DXCC, is back on RN6 and is on TCC handling traffic. K7ARV is having antenna troubles. AHA joined the ARRL and has an all-band trap doublet. EBJ moved from Reno to Elko and soon will be married, Get your reports in by the 4th so I can have some news for this column. Look me up at 810 Front St. in Elko. Traffic: W7VIU 121.

have some news for this column. Look me up at \$10 Front St. in Elko. Traffic: W7VIU 121.

SANTA CLARA VALLEY—SCM, G. Donald Eberlein, W6YHM—Asst. SCM: Roy E. Pinkham, W6BPT, SEC: W6NVO. PAM: W6ZLO. RM: K6PQH. Your SCM would like to thank all of you who have been so good about reporting regularly. His special thanks go to W6BPT, who so capably prepared this column each month as Asst SCM and kept things going during our numerous periods of absence; to W6NVO, who so faithfully carried the SEC load with a perfect report record to Headquarters; and to outgoing RM W6QMO, whose unselfish efforts brought new life to NCN and have made it one of the outstanding NTS section nets in the West. It has been a real privilege and pleasure to work and serve with you all. With an eye to the future, here's a doff of the haft to your new SCM, K6DYX, and every good wish to him for a successful term. Anyone interested in high-speed traffic skeds will find K6GZ, K6DYX and K6GES on 3750 kc. nightly at 1930 PST. W6QMO reports a successful campaign to raise a Braille mill for K6YBV. K6VJI is constructing a flying spot scanner and holding traffic skeds with KG6AAY. K6TNM is back on 6 meters with an 829-B transmitter and a Filter King converter. K6LEE and K6MPN are sporting SX-101s. EC W6DEF reports c.d. base stations W6WWJ and K6GEWY. New appointments: K6PQH as RM; K6OSX as OPS; K6PQG as ORS. Renewals K6ALH as OO; W6QIE as EC. ARRL Asst. Gen. Mgr. John Huntoon discussed the coming Geneva Conference at the Oct. 13 SCCARA meeting. Traffic: (Sept.) K6DYX 443. K6GZ 404, W6PLG 265, W6QMO 226, W6BPT 153, K6HGV/6 129, W6RFF 84, K6PQH 82, K6PQG 76, W6FON 73, W6YBV 59, W6DEF 39, W6YHM 39, W6AIT 30, W6OII 18, K6VJI 17, W6ZLO 6, (Aug.) W6OII 53, K6CHY 37.

W6FON 73, W6YBV 59, W6DEF 39, W6YHM 30, W6AIT 30, W6OII 18, K6VJI 17, W6ZLO 6. (Aug.) W6OII 53, K6CHY 37.

EAST BAY—SCM, B. W. Southwell, W6OJW—Asst. SCM: Mary E. Lorenz, W6PIR. SEC: W6CAN. ECs: W6LGW, W6ZZF, W6IUZ, K6EDN, K6JNW and K6QZG. K6TKL is the new Assistant EC of the Hayward Area. W6ASJ is busy with RTTY bulletins. K6IGN, the Richmond High School club station, has 5 operators. K6DMW has a new Central Electronics 10B and is on NCN and RN6. W6AKB is back from vacation and working DX. W6OJW is getting close to DXCC. K6GK is building a power pack and an antenna for the 2-meter rig. K6DMI is checking in on MARS. K6QHC scored 68,980 in the W/VE Test and now has a DX score of 128/64. WV6BKR has 30 states out of 40 contacts. W6FAR skeds his brother W3CU once a week for family news. WV6AFF received his General Class ticket. W6VCG gave an illustrated lecture on diodes and transistors to the E. Bay RC. K6ZWD made the General Class exam. K6PQH is the new manager of NCN. W6SWP has been discharged from Oak Knoll Hospital. W6PIR is newly married. WA6CAM is a new General Class licensee, K6RPZ has a new KWS-1. K6JAY is mobiling. K6KWX is selling the station and moving to Idaho, K6IRB has a new S-53 and a ground plane. K6AQ has his modified BC-1068 perking on 2 meters. W6IEH bought a 6-meter converter at the MDARC auction, W6OHR won September's MDARC hidden transmitter hunt. K6KYT is operating at ON4UB, Worlds Fair Station in Brussels. K6JES, K6LLM and K6TNA are back at Cal. Poly School. W6CMG now has 94 for DXCC. K6JPR has worked KH6, ZL, KR6 and VK on RTTY, K6OGT is building a new rig. W6IF talked on the HARC about 'scopes, W6SWY has a new Triband beam. The XYL of K6YAF is recovering nicely from an autoaccident. W6KEK now has a DX score of 215/205. K6RZR is NCS on the Silverado Six Shooters Net. W6WLW is on s.s.b. on 20 meters with a kw. and skeds Okinawa. K6BBU and K6BYQ operated portable on Mt. St. Helena during the V.H.F. Party but QRM from V6KOX/6 was too much. K6QXY is a new OES in Crockett, has a new 6-meter rig



communications equipment

VHF-AM FOR:

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ANTENNAS REMOTE CONTROLS ACCESSORIES



# **COMCO'S ALL NEW**

"580 FLEETCOM"

VHE-EM MORILE RADIO

# FEATURES

★ HIGH PERFORMANCE ... meets "split channel" technical requirements, all FCC and FCDA requirements.

★ FULL POWER OUTPUT . . . 35 Watts in 25-50 Mcs. 25 Watts in 144-174 Mcs.

★ BUILT-IN RELIABILITY...Preproduction Models field tested in 5 states and 3 foreign countries before starting production.

★ SMALL AND LIGHT WEIGHT...Chassis in case 13"x9\%"x5\%". Control-power Supply-Speaker case 5"x5"x3\%". Complete Mobile installations 24 lbs.

★ EASY TO INSTALL . . . "Two-unit" package so small most installations are under dash.

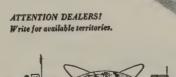
★ LOW COST ... Complete mobile package

\$398 f.o.b. factory

\* EFFICIENT ... Transistor power supply gives high efficiency. Total standby drain 5.25 amp.

\* INTERCHANGEABLE CHASSIS . . Mobile transmitter-receiver chassis instantly interchangeable with base stations in simplex systems.

The new "580" is compact, light weight, has high performance, and features an original concept in Mobile equipment packaging by combining the control head, speaker, and transistorized power supply in one small easily mounted case assem-



"580" series transmitterreceiver chassis.

RADIO COMMUNICATIONS EQUIPMENT





# SIDEBANDER DSB-100

SWITCHING 10-BOM; 100W P.E.P. DSB INPUT, SUP-PRESSED CARRIER; 40W AM PHONE; 50W CW

\$1155 per mo. \$14.00 Down \$139.95 Cash Kit Form: \$990 \$12.00 Down

or \$119.95 Cash



This dandy, complete transmitter will give you the right start in amateur radio. Use it for 50w CW until you get your general license. Then add the standard VFO and regular crystals and go either AM or Sideband, or both. Later on, you can increase your power by coupling the Sidebander with other equipment, and took at these features: Exclusive automatic balancing and floating grid circuit holds carrier suppression to 40db or better. Continuous band coverage 3-9mc and 12-30mc, covering MARS and CAP frequencies. Three stage RF section allows straight through operation for max, efficiency. Internal tone generator facilitates funding. Inverse feedback for high quality audio, Pi-Net, 52-300 ohms. Ceramic band and function switches. Speech clipping and filtering assures powerful communication punch and narrow band width. Provisions for Antenna Relay Control. Power socket on chassis rear width. Provisions for Antenna Relay Control. Power socket on chassis rear apron for external accessories. Housed in the new Forward Look Cabinet. Housed

# VOX Model 10

For voice operated control, with extra contacts for auxiliary circuits. Plug in socket at rear of DSB Xmtr. Adapt-able for other

W/T: \$24.95 Kit: \$19.95

QT-10: Accessory for VOX.

\$9.95

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SAN FRANCISCO—SCM, Fred H. Laubscher, W6OPL—I want to take this opportunity to wish each and every one of you a joyous holiday season and express my thanks to all for the many kindnesses rendered this office during the year. Our section is growing as the months go by. We have some new appointments: W6FEA is your new SEC; K6OHJ is OO and OPS; W6YOM is ORS; K6SRZ is ORS; W6WJF has taken on the duties of PAM. W6AJF, W6GQA and W6JOX were active in the Sept. V.H.F. QSO Party. Between other activities, W6GQA now checks into three MARS nets. W6GQA enclosed a newspaper clipping of K6AID, showing him pictured with his bicycle on which he vacationed 990 miles to Seattle. The past month found W6YC receiving the following four awards: WAP, WAZL, WAMC and WACC. Gene says DX seems to be improving. The Sonoma radio amateurs have joined in organizing a new defense and disaster network. The new set-up, operating on 75 meters, will give direct contact with San Francisco's new Disaster Center on Twin Peaks. W6GWQ, club president and Santa Rosa C.D. Communications Chief, reported enthusiastic response from his group on recent tests. This section is looking for c.w. operators who would enjoy traffic handling. The following areas in the north need covering: Ukiah, Ft. Bragg, Eureka, Arcata, Crescent City. The Northern California Net (NCN) is part of the National Traffic System (NTS) and welcomes old-timers and newcomers alike. It is on 3635 kc, at 1900 and 2200 PST, Mon.-Sat. Phone operators will enjoy traffic to and from your section by checking in with the Mission Trail Net, 3854 kc, 1900 PST daily, or with the American Legion Net, 3975 kc, 1900 PST daily. Have fun in traffic and be of service to your community by checking into one of these fine nets. W6AWT is busy as usual working the "rare ones." We need more fellows like Moli to help keep the signals RC is planning some unusually intersting meetings. The San Francisco RC had one of the most active years in the club's history. By the time this report has gone to print, Harry Wit RC is actively engaged in operations at its FB layout. The Cathay RC is planning to remodel its club house. Traffic: K6LCF 15, W6GCV 11, W6GGC 8, W6BIP 6, W6OPL 5, W6GQA 2.

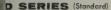
SACRAMENTO VALLEY—SCM, LeVaughn Shipley, K6CFF—The TVI Committee of Sacramento has lad quite a struggle for the past few months but we are happy to announce its survival. K6ORT reports that his son Tom is now KN6LVN. WeLTN and his XYL W6LTG are off to England for 3 years. W8USB/6, industrial arts professor at the Chico State College, and K6YOE "ham it up" almost every evening on 75 meters. K6MYL is on the active list again. Sacramento welcomes W6ZNU, who comes to us from Chico. W6FOD has just returned from Santa Cruz and reports that receiving conditions are very poor in that area. Hi! K6HDE is the new EC for Marysville. We'll miss hearing K6LGU while he is attending the University of California at Davis. W6PYE sent in confirmation for his DXCC. Congratulations to K6JJQ, who has a new license and is on phone for the first time. The new officers of the Tehama County Amateur Radio Club are K6RFT, pres.; K6RFD, vice-pres.; and K6SKG seey. K6YBV is a new asst. mgr. of RN6. W6QYX is having so much fun with 10 watts that he can't figure out what high power is for. W6ZF, our Vice-Director, transmits the Pacific Division Bulletins on the 2nd and 4th Mon. at 8 p.m. on 3540 ke. Traffic: K6YBV 875, W6ZF 11.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—I would like to apologize to the Bakersfield Area. I do have a fan down there, K6SWR. Many thanks for the news. W6GFZ has moved to Visalia from Arvin. W6NXT has a new mobile rig and is having a ball. The Bakersfield Radio Club meets the 2nd and 3rd Fri. of each month in the Bakersfield Police Building. W6PCZ has moved to Fresno. W6EUH is back in college in Modesto. W6AJE is getting his gear back into shape for the winter. W6PPO's new Q7H is 1015 W. Alamos, Fresno. W6TTX got married in September. Congratulations. W6JXY has an HRO-60 receiver. W6NTV, in Turlock, is looking for contacts on 432 Mc. W6PRU has a Gonset Communicator III and is mobile on 6 meters. The Fresno Radio Amateur Radio Club code class is going along very (Continued on page 162)

(Continued on page 162)

# Transistor Power Supplies\* and Components

\* Complete Units



Continuous operation at 30 watts. Selective taps at 200, 250 and 300 volts; intermediate voltage at 1/2 selective taps. Both voltages can be drawn simultaneously if total power does not exceed continuous ratings. Positive or negative ground operation. Input and output filtering included except for intermediate tap.

Size: 436" x 314" x 11/8" Wt.: 10 oz. 6- or 12-V Input: \$39.95 24-V Input: \$61.95

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Continuous operation at 45 watts. 450 volts and 225 volts simultaneous if total power does not exceed continuous ratings. Intermittent duty to 90 watts, 450 volts at 150 MA; 225 volts at 100 MA (5 min. on, 20 min. off). Positive or negative ground operation. Input (primary voltage) filtering; partial high voltage filtering provided.

Size: 43/4" x 31/4" x 11/4" Wt.: 14 oz

12-V Input: \$57.50 24-V Input: \$79.50



# **Toroid Transformers for Transistor Power Supply Application**

### 4 SERIES

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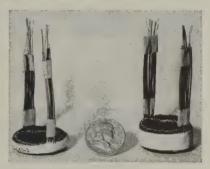
H-6-450-1 Input: 6-VDC. Output: 450-VAC center tapped...450 and 225 VDC from bridge rectifier...45 watts.

H-14-450-12 Input: 12/14-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...55 watts.

H-28-450-15 Input: 24/28-YDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier . . . 65 watts.

H-6-100-Input: 6-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 100 MA. 125-150-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped H-12-100-125-150-D for either 100, 125 or 150-VAC: DC Output: 200, 250 or 300-V at 125 MA. H-24-100-

Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 150 MA.



Without Encapsulation (2 ozs.), 1-10 units: \$16.00 ea.

With Encapsulation (3 ozs.), 1-10 units: \$18.50 ea.

# HD SERIES - 2000 CPS

ND-14-225- Input: 12/14-VDC. Output: Voltage doubler configura-300-2-D tion. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

HD-28-225- Input: 24/28-VDC. Output: Voltage doubler configura-300-2-D tion. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

Without Encapsulation (3½ ozs.). 1-10 units: \$18.50 ea. With Encapsulation (41/2 ozs.), 1-10 units: \$21.50 ea.

# HDS SERIES - 2000 CPS

HDS-14-225 Input: 12/14-VDC. Output: Voltage doubler configura--300-3-D tion. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

HDS-28-225 Input: 24/28-VDC. Output: Voltage doubler configura--300-3-D tion. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

Without Encapsulation (31/2 ozs.). 1-10 units: \$21.50 ea. With Encapsulation (41/2 ozs.), 1-10 units: \$24.50 ea.

### 100 CYCLE SERIES

14-115-1.5-400 Input: 12/14-VDC. Output: 115-V at 1.5 amp. 24-115-1.5-400 Input: 24/28-VDC. Output: 115-V at 1.5 amp.

Dim: 3" dia. x 1" thick. Without Encapsulation (12 ozs.). With Encapsulation (16 ozs.). Per Unit: \$76.00.

Matched Pair HD Transistors: 12/14-V operation-\$11.00 per pr. 24/28-V operation-\$21.00 per pr.

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BETTER STILL, COME IN - PLENTY OF PARKING SPACE

nicely with about 20 students wanting their tickets. W6PSQ and K6BKZ are in charge. W6NTV has a 100-ft. tower with an antenna on 432 Mc. W6DUD and K60GX went up to Mt. Pinos during the V.H.F. Sweepstakes and made lots of contacts. W6NAS has a Triband beam on a telescoping tower. W6PXP has a Gonset receiver for his mobile rig. W6NKZ got the bugs out of his powerful 10 watts on 75-meter mobile. K6VWF is heard on 75-meter mobile. K6QOK is building a new final using an 813 on 40 meters. Anyone interested in an ORS appiontment? Traffic (Sept.) W6ADB 82, K6RLX 6, W6ARE 4, K6SNA 3. (Aug.) K6SNA 2.

# ROANOKE DIVISION

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: HUL. PAM: DRC. V.H.F. PAM: ACY. The NCN has been reactivated, thanks to BAW. Space limits these section reports, so please be patient. The Tar Heel Emergency Net met the challenge of "Helene." The net was activated at 1930 Sept. 26 on a "watch" basis. LCV, CVU, WSS and RRH copied the Miami Weather Station on RTTY and passed information along to the various nets. At 6658 Sept. 27 a state of emergency was declared in Area No. 3. (3865 kc.) TJA established an Information Net on 3855 kc. Both nets were closed at 2318 Sept. 28. The following operators handled the nets: K4DHV, EYZ, K4CAU, TJA, ZKE, K4DWX, K4LWL, AWH, K4IEV, WSS, HUW, HUL and DCQ. BAW reports that he logged 250 stations and handled 63 formal messages and 68 informal messages. Al spent 38 hours on duty with 1½ hours on emergency power. LXH, of Alamance County, reports his AREC-RACES group was set up and ready to go. There may have been received. MARS was activated with K4WDF acting as liaison station to handle traffic to the Red Cross, Third U.S. Army and to states outside North Carolina. Amateurs who are also MARS members and who acted as NCSs on 5760 kc.: AAH6CBF, A4AMY and A4RRH. All communications services were used. RACES joined with the Tar Heel Net. CAP and the highway facilities were used.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GOV—SEC: K4PIE RM. AKC PAM: YOS Hur-

services were used. RACES joined with the 1ar Heel Net. CAP and the highway facilities were used.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE. RM: AKC. PAM: YOS. Hurricana Helene and the S.E.T. gave members of all three nets a good workout. The participation by net members and the discipline were gratifying. The panel discussions by net members and net managers on Oct. 11 will do much to coordinate the nets to the advantage of each. K4HQK is a new ORS. K4LEI has completed a 6-meter rig. K4LML has moved to Florida. K4DFR and K4QZA are in Clemson, along with K4BMV, K4CXJ'S OM, W2KGO, can be heard on s.s.b. on 14,306 kc. as KA2LT. K4ADD monitors 3930 kc. regularly from Arlington, Va. The chief operator of K4FAI (Burt, K4TMS) departed Nov. I for KX6-Land. K4AXV was interviewed on "The Teenage Roundup" during "Helene" on WIS-TV. GCB, HAP, K4AYG and K4GIE are on the air at Clemson with a Collins 75A-2 and a 32V-3. The Aiken Club made a tour of the ham shacks of AIB, KYN and CAL on Sept. 17, following which an auction was held for the benefit of the club. Traffic: K4WCZ 200, W4AKC 103, K4AVU 103, BVX 75, W4PED 63, DAW 48, K4BLF 43, W4CHD 32, CJD 32, K4GAT 28, W4BHR 24, K4IIE 23, K6RUO/4 14, K4PIK 10.

32, CJD 32, K4GAT 28, W4BHR 24, K4IIE 23, K6RUO/4 14, K4PIK 10.

VIRGINIA—SCM, John Carl Morgan, W4KX—VN and VFN were both alerted and ready during Hurricane Helene, which fortunately avoided Virginia. K4MJZ reports fine official cooperation with the AREC by the Arlington Red Cross and Police, with several hams being furnished emergency generators. K4QIX's XYL is now KN4AJL; CHK's dad and sister are KN4SAB and SAF, who await Conditional class tickets; KN4AJJ, new in Winchester, is the son of the late NLT. Collegiates: VQZ at M.I.T.; K4MBL and K4BYS at U. of Va.; TVI and K4HJZ at N.C. State; CXQ, K5BUI and K4HIQ at V.P.I.; UHG at Hampden-Sydney; YZC at Wake Forest; PVA slaving nights at G.W.U. The SVARC again assisted with the Winchester Lions Broom Sale. OOL says 2-meter activity is booming in the Valley Area; as also is the case in the Tidewater Area, according to ZPE. K4KWW and SYW operated Danville ARC's CB during the V.H.F. Party. The Hampton Roads ARC is sponsoring a Half-DXCC Award for Novices, with certificates No. 1 going to KN5LZO. PRO reports a ham demonstration at Langley AFB by 3IWN/4, K4KTR and KN4SBK. K4PAO reports a 75-meter morning net of radio-TV servicemen every week day at 0700 on 3805 kc. Sixty-nine logs of "Va. Free For All" participants were received by the SCM by the deadline. Winners will receive certificates and results will be sent QNC on VN, VFN and VSN. (Continued on page 164)



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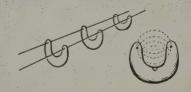


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All Virginians are urged to participate in any or all of these nets: VN, 1900 EST daily and VSN 1830 M-F, both on 3680 kc. and VFN, 1900 daily on 3835 kc. No special invitation is required and all are welcome. Traffic: (Sept.) W4PFC 630, K4EZL 623, ELG 568, QIX 520, W4QDY 333, K4KNP 254, W4SHJ 234, K4JKK 191, QES 171, W4BZE 135, K4DSD 78, W4RHA 57, EMH 37, CVO 30, KX 30, UHG 19, K4QER 18, EIG 14, W4LW 10, K4IIP 8, KDJ 8, W4SNH 8, CXQ 7, OOL 7, K4LEF 4, MJZ 4. (Aug.) W4PVA 134.

WEST VIRGINIA—SCM, Albert H. Hix, WSPQQ—SEC: HZA, PAM: GAD, RMs: GBF, FNI, PBO and VYR. V.H.F. PAM: KSIYQ. The W. Va. Worked All County and Worked W. Va. Awards are creating much interest both in and out of the State. The fellows who are spending a lot of their time operating mobile in the rare counties are certainly to be complimented. The SEC is interested in increasing the AREC membership and EC appointments in counties which are not presently signed up. If interested, please apply to HZA. QWE has a new Ranger and is in a new QTH at Clendenin. ExUEN is now K2PDA. SSA is very QRL. VAN is on s.s.b. in Charleston, CRM is now at Alderson-Broaddus College, KLI is mobile. CSG is getting ready for 10-meter fall activity. K8HAI, KNSLGU and the XYL of K8BIT (awaiting her General Class ticket) appeared on a 15-minute TV program in Charleston and discussed ham radio. K8IYU is the new V.H.F. PAM. The slow-speed net on 3570 kc. daily at 1800 EST has very good participation. HRO, DFO, KNC and FNI participated in the last V.H.F. Party. The Weather Net is doing a fine job. JNX, CAY, IYU and K8HRO attended the Cincinnati Hamfest. DDB has his receiver back from the factory after being repaired, HID is building a new 814 final. JUE is a new ORS. Traffic: (Sept.) W8PBO 103, K8HID 77, W8VYR 63, HZA 45, BWK 34, K8CNB 28, W8DFC 14, PQQ 9, K8CSG 6, HRO 2, JFF 2, W8QWE 2, (Aug.) W8BWK 24, K8CRM 6.

# WEST VIRGINIA QSO PARTY

December 6-7

To aid amateurs in their pursuit of the Worked West Virginia and Worked All Counties in West Virginia awards (p. 63, September *QST*), the Kanawha Radio Club is sponsoring a QSO party

Virginia awards (p. 63, September QST), the Kanawha Radio Club is sponsoring a QSO party to be held December 6 and 7.

Rules: 1) Stations outside W.Va. will work as many W.Va. amateurs as possible, using any band or mode. Outside stations will sign "WVA" after their call. 2) Each contact will contain a QSO number, RS or RST report, and state or country. 3) Stations may be worked once on each band and may be worked on as many bands as desired. 4) Score one point for a complete QSO exchange per band. Incomplete contacts do not count. 5) Time of contest: 6 P.M. EST Dec. 6 to 6:00 P.M. EST Dec. 7. 6) Suggest frequencies: 3570, 3890, 7050 and 20 kc. inside each band and phone sub-band. V.h.f. stations should check 50.760 Mc. for 6-meter contacts. 7) Awards will be presented to the top scorer in each state or country. Amateurs in W.Va. will be given awards for first, second, and third place, 8) Logs should be submitted to Contest Committee, Kanawha Radio Club, Box 129, Spring Hill Station, South Charleston, W.Va. 9) Decisions of the judges will be final.

# ROCKY MOUNTAIN DIVISION

COLORADO—SCM, B. Eugene Spoonemore, WØDML—SEC: NIT. PAMs: IJR and CXW. KQD visited in Iowa. The Montrose Club has an outstanding traffichandling group. KØLSL won the June V.H.F. Party technician award. The Denver Area group is very active on 6 meters; there are 40 members and plans are being made for transmitter hunts on this band. The group recently held a picnic with fifty present. KØJSR conducts theory classes each Fri. evening. The Western Slope Radio Club held its Annual Picnic Sept. 21. The Coffee Club gang held its Annual Hamboree at Poncha Springs Sept. 13 and 14. KØDXF, DDM and Ruth did the main planning and there were 50 present from 15 different towns. KØHEH, CEZ, IYE, WØIA and RRV, the new publishers of the Bark, are looking for additional help. KØLZF is the new editor of the El Paso Radio Club (Continued on page 186)



"THE BOSS"...O.L. (Roy) Dewey, W1GWD. As Manager of Raytheon's Government Services Division, Roy Dewey is boss of the division's field engineers stationed around the globe. Here, in his well ordered shack, he relaxes as he talks to the Raytheon gang during a net session.

"THE SHIRT"... AI Robbins, KH6CBA. You'd be wearing something like this, too, as Raytheon's senior field engineer in old Hawaii. Al and many of the other hams in Raytheon's field engineering organization keep in touch with each other during weekly skeds on 20, 40 and 80 meters.

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Superb, truly versatile modulator at low cost. Can deliver 50 W of undistorted audio signal for phone operation, more than sufficient to modulate 100%. EICO =720 CW transmitter or any xmitter whose RF amplifier has plate input power of up to 100W. Multi-match output xmfr matches most loads between 50-10,000 ohms. Unique over-modulation indicator permits easy monitoring, no need for plate meter. Lo-level speech clipping & filtering with peak speech freq. range circuity, Low distortion feedback circuit, premium quality audio power pentodes, indirectly heated rectifier filament. Excellent deluve driver for high-power class B modulation. ECG& 12.847 speech ampl., 6AL5 speech clipper, 6AN8 ampl. driver, 2-EL34/6CA7 power output, EM& over-mod. indicator, C234 rect. Finest quality, conservatively rated parts, copper-plated chassis. 6" H, 14" W, 8" D.

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News-Letter. At the Annual Denver Hamfest there were five two-letter call members present—W\$\theta\$ 1A, IC, IO, PG and TX. WDM/mobile XE is attending school in Old Mexico, K\$\theta\$PSV has a new 15-meter beam. LO, PG, SIN, YHI, VDY, VSN and K\$\theta\$HPF were among those who participated in trying to locate the lost boy near Camp St. Malo. HXP and family vacationed in Illinois, PSX in Nebraska and OEV in Michigan and California, Traffic: (Sept.) W\$\theta\$IA 924, KQD 204, DQN 105, K\$\theta\$EDK 72, W\$\theta\$W\$ME 70, K\$\theta\$DCW 62, W\$\theta\$QOT 54, K\$\theta\$EVG 47, W\$\theta\$TYN 134, K\$\theta\$EDH 28, (Aug.) W\$\theta\$IA 862.

UTAH—SCM, Thomas H. Miller, W\$\tag{Q}QWH—ASS\$L, SCM; John H. Sampson, 70CX, SEC: PSC: PAM: BBN, V.H.F. PAM: SP. RM: UTM. OCX is the new Vice-Director for the Rocky Mountain Division effective Jan, 1, 1959. K\$\tag{TSE} K\$\tag{TSE} L\$ cards for the gang on 10 meters who need Utah for WAS, TWN (formerly RMN) is now back on 3750 kc, after spending the summer on 40 meters. News-Letter. At the Annual Denver Hamfest there were

In 1959. K/BHE reports that he has been passing out quite a few QSL cards for the gang on 10 meters who need Utah for WAS. TWN (formerly RMN) is now back on 3750 kc. after spending the summer on 40 meters. FSC, QWH and VFY have erected new poles. CVE, who recently received his General Class ticket, is now on the air with a Viking Valiant and an FB signal. Applications for 1959 call letter license plates should be mailed on or before Dec. 1, 1958. KN7s ELE and GBJ are new Novices in American Fork. GlQJ was guest speaker at the September UARC meeting. Traffic: W7-JBV 128, OCX 40, QWH 2.

NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN. PAM: ZU. V.H.F. PAM: FPB. RM: DWB. The NMEPN meets on 3838 kc. Sun, at 0730 MST and Tue. and Thurs. at 1800 MST. The Breakfast Club meets Mon. through Sat. on 3838 kc. at 1900 MST. Try to check in on as many of these nets as you can. K7DVB and K5MAP have received RCC from station K5WSP. Albuquerque had a C.D. Alert on Sept. 11, also a drill with c.d. representatives at WNU. ZM, the club station at Roswell, is very active again and in the process of putting up a beam. Your SCM didn't get very much news this month, so how about sending in information on what you are doing. At present we have 12 very active ECs in the State. The ECs meet each Sun. on 3808 kc. at 1900 MST. Anyone wishing to listen or check is welcome to do so. The purpose of the net is for the ECs to get together with the SEC and SCM. Traffic: K5USAP 4, WSZU 4, KN5PRR 2, K5IQL 1.

WYOMING—SCM, Lial D. Branson, W7AMU—The Pony Express Net meets every Sun. at 0830. The YO Net meets Wed. evenings on 3610 kc. AEC is a new grandpa. NVX has a new beam up and works lots of DX. DTD is on a vacation trip South, SZZ reinforced the beam and is working DX. K5DDG/7, of Laramie, has a new call, K7DDG. There are a lot of our hams down at Wyoming University, Laramie, LVU, XYM and AMU are holding schedules on 2 meters. There seems to be prospects of more 2-meter rigs. QPP, Sheridan, reports progress is good in next year's hamfest arran

# SOUTHEASTERN DIVISION

ALABAMA—SCM, Clarke A. Simms, jr., W4HKK—SEC: EBD. PAMs: DGH and K4BTO. RM: RLG. Congratulations to K4GBO on being elected the outstanding NCS of AENP for the third quarter of this year. Welcome to another new EC, FDD, who will handle Chilton County. Another new one to help you make YLCC is K4ZXZ, in Tuscaloosa. The code and theory classes of the Tuscaloosa Club started Oct. 2. New appointees are K4PHH and KAK as OPSs and GZM as OES. EW continues active on 2 meters from Montgomery. K4SSB is active in most contests, K4PHH is building a new shack and with his XYL K4TDJ is working 10 and 20 meters with a new beam. New clubshave been formed in Troy and Greenville. Those interested in joining may receive details from the SCM. A group in the Huntsville Area are working on 1215 Mc. equipment and the Birmingham group has a TV project going. Please send news or articles and pictures for the section bulletin to Howard Kirkpatrick, WAZ, 1135 Jackson Highway, Florence, Ala. Traffic: W4RLG 401, PVG 46, DGH 34, K4BTO 32, JDA 19, W4CIU 18, K4POZ 17, W4MI 13, K4KBT 12, AOZ 10, JBW 9, SSB 9, PHH 8, HJM 5, KJD 5, W4WAZ 3, HKK 2, K4KAK 2. EASTERN FLORIDA—SCM, John F. Porter, W4KGJ—SEC: IYT. RM: K4SJH. PAMs: TAS and RMU. Section nets: FPTN, 3945 kc, at 0700 Mon. through Sat.; FMTN, 7230 kc, 12 noon Mon, through Sat.; GN, 7105 kc. Mon. through Sat., fast session 0900 to 1000 and slow session 1000 to 1130: FEPN, 3910



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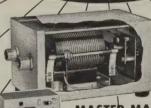
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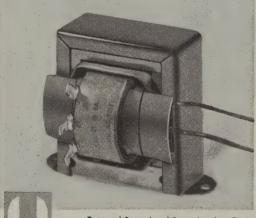
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F-10U	5.0 CT.	14	10000
F-71U	2.5 CT.	10	10000
F-72Z	2.5 CT.	5	7500

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kc. 1830 Tue. only. K4SJH made BPL in September and K4RZQ and DRO made it in August. WUU has a new HQ-110 and a Lettine transmitter. K4ODS is the new asst. net manager for FMTN. YOX is the new net manager for GN. MBO is back on with a TBS-50D. K4COO has a new 3-band ground-plane for DX work. LDM and KZT have an all-nam family now with their two kids getting their tickets. BWR is now on 2 meters with a new Gonset III. 3EGJ, at Orlando, now has a new tower up and is maintaining regular skeds with De-Land and Daytona Beach on 6 meters. EHW is set up for emergency work with a new 2.5-kw. power unit. FFF says he can now hear them with his new 75A-4 and work them too with that 4-400A in the final. Lake Wales now has 12 v.h.f. stations on 2 meters. DPD is the spark plug up that way. K4TCM is the new Asst. EC for E. Volusia County. The After School Net, ASN, meets Mon., Wed. and Sat. on 7105 kc. at 1700 EST. K4RZQ, in Citra, is net manager. All teenagers and other students are urged to check in. The Dade Radio Club was presented with the Florida Skip Field Day trophy Sept. 2 by IYT, Skip editor. AHZ is the new c.d. director for Broward County. ZUT is the new EC for Monroe County. NGR is the new EC for Seminole County. Did you know "Homer" is home from Chattahootchee? Traffic: (Sept.) K4SJH 1354, GPI 405, LCF 212. W4TAS 108. DVR 98, YOX 90, K4BR 88, W41YT 88, K4RNS 85, COO 74, R2Q 72, AKQ 66, W4LDM 64, K4AHW 63, JCF 45, BLM 44, KDN 44, LLB 38, W4SGY 31, K4ODS 29, W4ZIR 25, BWR 21, K4BNE 16, W4DPD 15, K4-OSQ 15, JJZ 12, W4FFF 11, K4YOQ 11, ANJ 8, IWT 7, W4SJZ 7, W3EGJ 6, W4BJI 5, FJE 5, K4MTP 4, W4-EHW 2. (Aug.) K4DRO 179, W4PJU 175, K4ANJ 5. W4STERN FLORIDA—SCM, Frank M. Butler, ir., W4RKH—SEC: PQW. RMS: AXP and BVE. Pensacola.

EHW 2. (Aug.) K4DRO 179, W4PJU 175, K4ANJ 5.

WESTERN FLORDA—SCM, Frank M. Butler, ir., W4RKH—SEC: PQW. RMs: AXP and BVE. Pensacola: K4QQO moved to a new QTH. K4RMO worked a DL4 with his 18-watt mobile. AXP continues active in LO Parties. K4ZJF has a new Mohawk and an Apache. K4PIQ has a very neat ham shack and FB antenna farm. HYL has a new Triband beam on a 60-ft. tower to go with the kw. PAA still is Mr. DX in town. RDC and family had a nice trip to Arizona. Panama City: K4OID has been appointed ORS. BVE, NCS of NWFN, has moved to a new QTH in Ft. Walton. K4UBR got 60 contacts and 8 zones in the W-VE Contest. K4PVU reports the Tallahassee 2-Meter C.D. Net still is active. He also is working with the Leon High School Radio Club. K4RZM, Port St. Joe, has appointed K4RZF and K4LQQ as Asst. EC. KN4UPI is a new ham in St. Joe. Hams in Ft. Walton who assisted in parades the Labor Day week end were treated to a fish fry by the Police Department in appreciation for their services. When it appeared that a hurricane was heading this way, Eglin AFB made available 10 emergency power units to members of the 10-meter emergency net. Traffic: K4UBR 336, W4BVE 135, SRK 74, K4OID 56, PVU 24.

Bers of the 10-meter emergency net. Traffic: K4UBK 336, W4BVE 135, SRK 74, K4OID 56, PVU 24.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: K4AUM. PAMs: LXE and ACH. RM: PIM. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0800 Sun.; ATLCW on 7150 kc. at 2100 EST Sun.; GSN Mon. through Sat. at 1900 EST on 3595 kc. with PIM as NC; the 75-Meter Mobile Phone Net each Sun. at 1330 EST on 3995 kc. with W as NC; ATL Ten-Meter Phone Net each Sun. at 1300 EST on 3995 kc. with W as NC; ATL Ten-Meter Phone Net each Sun. at 2200 EST on 29.6 Mc, with VHW as NC; GTAN Sat. at 1000 EST on 7290 kc.; the GPYL Net Thurs. on 7260 kc. at 0900 EST with K4CYV as NC; the Ga. Novice Net Thurs., Tue. and Sat. at 1800 EST on 7157 kc. with K4HMS as NC; the GAN on 7105 kc. at 1800 EST Mon. through Fri. with K4KZP as net mgr. The GAN Net is now a member of the National Traffic System. GSN still needs more operators. PIM is doing an FB job as NC. Let's check in more often with Jack. K4FBA has a new kw. linear amplifier. K4-LVE and ETD are in a new QTH in Warner Robins. K4KZP made BPL in September. K4OCI has an SX-28 now. K4LEM has a new Knight kit to be used for portable operation also. HYW is doing an FB job as QSL Mgr. Keep him supplied with envelopes. FWH made a trip to Brasstown Bald to operate on 144 Mc. Bad weather conditions hindered operation. IMQ's son is now a Novice, K4AEK. K4AIQ is seey.-treas. for GPYL. The Thomasville, Ga., Radio Club now is reactivated with ZDP, pres.; VBF, vice-pres.; QBG, secy.-treas. KN4-ACT is a new ham in Thomasville. Check your ARRL appointments for renewal dates as they have to be renewed each year. Make sure you are registered with your EC. Traffic: K4FBA 294, LVE 229, W4PIM 200, K4KZP 197, BAI 96, W4BXV 83, K4LEM 11, W4HYW 4.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA. DJ now is using an antenna tuner and an SWR meter on all bands. DJ handled emergency traffic to Washington, D. C., on 40-meter c.w. with W3CDQ. AZ is using a rebuilt BC-610 on 40 meters. RD is on 3925 kc. using a KWS-1 with one sideband and carrier. KP4GN is operating mobile on 75, 40 and 10 meters. (Continued on page 170)

# HARVEY

NEW! Do-It-Yourself **EICO Ham Kits** 

90-Watt CW Transmitter Model 720

The new EICO Model 720 is a very "clean" 90 watt CW, 80 through 10 meters bandswitching amateur transmitter. Some important design features are: one-knob band switching; tune and operate switch; final amplifier grid drive control without detuning oscillator; oscillator keying for break-in operation, a "novice limit" calibration (75 watts) on the meter.

KIT \$79.95 WIRED \$119.95 SPECIFICATIONS — Power input: 90 watts CW (novice limit calibration on meter); 65 watts AM-phone with EXT plate modulation. Output impedance: 50-1000 ohms. Band Coverage: 80, 40, 20, 15, 11, 10 meters. Operation: XTAL, EXT. VFO. Cabinet Size: 15" wide x 5" high x 9" deep. Shipping Weight: 27 lbs.

DIP METER HARVEY BUY

METER MODEL 710 — An exceptionally versatile, stable, rugged, compact design.

Basically a VFO with a microammeter in its grid circuit, it determines frequency of other oscillators or tuned circuits; has a sensitivity control and phone jack to facilitate "zero beat" listening. Also excellent as an absorption wave meter. Ham uses: pretuning and neutralizing transmitters, power indication, locating parasitic oscillations, antenna adjustment, correcting TV1, general de-bugging with transmitter power off, determining C, L, Q, etc. KIT \$29.95 WIRED \$49.95 including complete set of coils for full band coverage.

SHAKESPEARE - WONDEROD NORMAL MODE HELICAL ANTENNAS. Now — an efficient distributed-load antenna built into a Shakespeare Wonderod! You can mount this shortened antenna on trunk or fender without a spring mount. Glass fibers run the entire length of the whip, with the coil wound inside the lower half fiberglass. The result is superior electrical characteristics and the appearance of a standard whip.

STYLE	62-3	62-4	62-5	62-6	62-7
BAND	10 meters	15 meters	20 meters	40 meters	80 meters
APPROX. LENGTH	4'	4′	6′	6′	6′
PRICE	15.90	15.90	18.75	18.75	18.75
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Special 40 and 80 meter bumper mount antennas in 8' lengths - \$21.00

# CUSHCRAFT BLITZ BUG -A Coaxial Cable Lightning Arrester

This all new Lightning Arrester, for standard co-axial cable, is designed to eliminate heavy static charge build-up — protecting valuable radio equip-ment. There is no insertion loss from Blitz Bug; it will not affect performance or S/W/R, to 150 MC. ONLY \$3.95



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and tell us what you have to trade. You probably won't believe your eyes when you see how much we'll offer! Walter Ashe stocks all the latest releases in home receivers and transmitters...plus everything you need in parts, test equipment and High-Fidelity. Select the equipment you want from the new Walter Ashe 1959 catalog. It's packed with everything in Ham Gear from leading manufacturers. Plenty of new SSB units to choose from, too! Buy on liberal payment plan if you wish.

# FREE NEW 144 PAGE

The complete buyer's guide for hams, experimenters and schools. Offers the largest selections of new and replace-

ment equipment for all your needs. Rush coupon for your FREE copy today!

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	WALTER ASHE RADIO CO., Your One-Stop Supermarket Dept. Q-12-58 1125 Pine St., In Our 37th Year St. Louis 1, Mo.  Rush New Catalog Send latest lists of guaranteed Used Equipment Rush "Surprise Trade-in" offer on my
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1	CITY ZONG STATE

AMG raised both 80- and 40-meter antennas and is rebuilding the 400-watt transmitter. KV4BA is accumulating a Lampkin frequency meter and other instruments for marine radio repairs at St. Thomas. KP4DV does marine work in P.R. ACQ, ADK and ADI are studying for 2nd-class radiotelegraph licenses at Vocational School with AQ as instructor. CU is installing v.h.f. relay stations for the power co. AMG has been acting as NCS of the P.R. Amateur Emergency Net on 3925 kc. every Wed. at 8 P.M. RD has a 5-kw. emergency power plant. The following meet on the Antilles Weather Net on 7245 kc. at 7 A.M. and 5 P.M.: KP4USA, the NCS, and VP2s AB, DA, DJ, GV, KH, LS, SH, KV4s AA, AY, VP4KW and VP4MM. The Puerto Rico Emergency Net frequency is 7245 kc. to 6 P.M., 3925 kc. after 6 P.M. W4WIV, former NCS of the Kentucky Phone Net, operators at KP4USA 50/60 hours a week. KP4KD has a new Mosley Tribander beam. ADY is building an 813 transmitter to increase the power from the present four watts. WT again is monitoring 3925 kc. 7 A.M.-10 P.M. daily. K5CEV now lives in Ponce. AJK is on 6 and 2 meters and joined the AREC. AJK uses a five-element beam on 6 meters. CK/CL soon will be on with 458-20A-600L. The PRARC has discontinued its WPR50 certificate award and replaced all above 25 with stickers. Traffic: KP4WT 99, DJ 2.

CANAL ZONE—SCM, P. A. White, KZ5WA—Correction to Station Activities in Oct. OST: It was WI

award and replaced all above 25 with stickers. Traffic: KP4WT 99, DJ 2.

CANAL ZONE—SCM, P. A. White, KZ5WA—Correction to Station Activities in Oct. QST: It was WU who moved to Long Island in August with his "V" beam antenna and not WZ, who is now setting up a new Eldico S.S.B. kw. right here in the town of Diablo. The Crossroads Club gave a farewell party in conjunction with fellow employees in the Fire Department for UD, who has retired as fire chief and will live in New York State. BK has just finished a new code class on the Atlantic Side of the Isthmus. Your new SCM, Ralph Harvey, RV, will take over next month. The new SEC is RM. New ECs are HO and VR. New hams are MN, RL, BS, CE and LP. New Novices are RN, EWN, FWN and LSN. Traffic: KZ5KA 49, HO 36, VR 28, RM 7, WA 5.

# SOUTHWESTERN DIVISION

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F, Hill, jr., W6JQB SEC: W6LIP. RMs: W6BHG, K6HLR. PAMs: W6ORS, K6BWD. The following stations earned BPL for the month of September: K6HLR, K6CPT and W6GYH. Congrats, fellows! K6HLR has been appointed manager of RN6 and is looking for liaison stations. A new reporter is WA6BAQ. Glad to have you, Gary! K6OQD put in a lot of time at the L.A. County Fair. K6KYJ, K6OJV, K6TPL, K6COP, K6PLW and W6ORZ are feeling the pinch of schoolwork! W6BHG is taking a well-earned vacation. Have fun, Hank! W6BUK visited some of the MTN gang while on vacation. K6OZJ is getting lined up on RTTY. W6CIS has the CCDN meeting Wed. and Fri. for training and QSO sessions in addition to the regular Mon. night meetings. K6EA still is traveling around as relief "Sparks" for Matson Lines! W6ORZ is organizing a club at St. Anthony's High School in Long Beach. K6GLS is putting up a trap doublet and getting a new RME operating desk! All you fellows interested in 220 Mc. are asked to contact K6GKX for membership in the Inter County Net, which meets Mon., Wed, and Fri. at 2000 PST on 221.5 Mc. K6SLM spent his vacation in Wyoming. W6MGB has a new four-element wide-spaded beam on 6 meters. Support your section nets—phone, the SoCal 6 Net at 1930 PST on 50.15 Mc.; c.w., the Southern California Net at 1930 PST on 3600 kc. Traffic: (Sept.) K6HLR 1108, K6CPT 640, W6GYH 634, K6-OZJ 241, K6PQM 179, W6HJY 121, W0BHG 41, K6COP 32, K6OQD 30, K6TPL 30, WA6BAQ 27, W6USY 18, W6CIS 13, K6EA 12, K6PLW 10, K6GGS 8, W6CMN 7, W6ORZ 7, K6IYJ 5, W6SRE 5, W6BUK 3. (Aug.) K6-MCA 1811, K6GGS 8.

ARIZONA—SCM, Cameron A. Allen, W7OIF—SEC: YWF, PAM CSN: FMZ, The Annual Hamfest held at

W60RZ 7, K61YJ 5, W68RE 5, W6BUK 3. (Aug.) K6-MCA 1811. K6GGS 8.

ARIZONA—SCM, Cameron A. Allen, W70IF—SEC: YWF. PAM CSN: FMZ. The Annual Hamfest held at Ft. Hauchuca over the Labor Day week end was enjoyed by all. There were lots of fine prizes and plenty of good food. NTK wanted to be thrown in the creek but the best he could do was get all wet in the rain. FMZ is now PAM for the Copper State Net. This net meets at 1930 MST on 3895 kc. For traffic and up-to-minute news around the State check in on this frequency. Everybody is welcome. IBK and K7DHL now take traffic from the 12th Regional Net for Arizona, GFQ is the new EC for the Tucson Area. UVR has been having trouble in his mobile with a gassy 4-1000. He has a new McElroy tape keyer unit. The Arizona Amsteur Club held its September Picnic on the patio at TPG's QTH. It was followed by a 75-meter transmitter hunt won by UXZ, who also won the hunt at Ft. Hauchuca. The AARC now meets in the new United Fund Bldg, at 16th and Osborn Rd, in Phoenix, Traffic: K7BWN 127, W7SUI 67.

(Continued on page 172)

# 65 WATT TRANSISTOR POWER PACK FOR MOBILE UNITS



# THE MINIATURIZED TRANSISTOR POWER SUPPLY MODEL PS-6-12

SIZE 6" h x 3" w x 1" h WEIGHT 1 lb. 2 oz. 6-7 v and 12-14 v INPUT VOLTAGES: INPUT CURRENTS: 12 amps or 6 amps AT NO LOAD: OUTPUT VOLTAGES: OUTPUT CURRENT: 1.5 amps or 0.8 amps 200 and 400 v

40 ma at 200 v; 135 ma at 400 v TOTAL OUTPUT RATING: 65 w nominal TEMPERATURE RISE:

20° C above Ambient 30° C Full Load—85% EFFICIENCY:





This special designed POWER SUPPLY used with Transmitters rated to 65W. continuous duty, or 75W. intermittent duty; will also supply a receiver with 200 V. @ 40 MA, continuous duty. Highly recommended for use in all MOBILE TRANSMITTER-RECEIVERS, e.g. automobiles, boats, trucks, motorcycles, aircraft, where power source is 6 or 12 V. Paralleling doubles ratings.

# **MODEL PSK-6-12 KIT FORM**

Identical to Model PS-6-12, except in Kit Form. Complete schematic and detailed assembly instructions included. Pre-tested quality assured components included, no other parts to be purchased. Simple to assemble in Heavy Aluminum Case . . . you save cost of labor. .........\$39.50

# **MODEL PST-6-12; POWER TRANSFORMER**

INPUT VOLTAGES: OUTPUT VOLTAGES: CONSTANT LOAD:

6-7 v or 12-14 v 200 v and 400 v

CONSTANT LOAD:

up to 65 W.

DUTY CYCLE:

25% to 85 watts

Toroid supplied with 6" leads, Teflon wrapped, epoxy resin coated. Toroid supplied with 6 leads, letton wrapped, cpo., proven for salt water use. Unit designed for your own particular \$14.00

# NOTE: ALL ITEMS EIA GUARANTEED.

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HEART OF THE MISSILE COUNTRY

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SAN DIEGO—SCM, Don Stansifer, W6LRU—W6GBG is back in San Diego after a tour of duty in Turkey. K6ITH is now active from KG4AO. W6GUP has moved to Blythe from Brawley. K6GJM received his General Class license and was promptly elected president of the Ryan Club. The Ryan Club is conducting code practice two nights a week on 40 meters. K6RZC is chief operator at W6YDK and the station continues to handle traffic. K6ZRC, in Fullerton, is now an OO. W6ELQ is back on the air handling traffic on PAN, CCDN and TCC. KN6TUP, in Pine Valley, has now worked 24 states. W6RCD has worked 97 countries on sideband since March, to bring his phone total to 162 worked. W6BLZ finally got long overdue cards and has applied for his DXCC certificate. W6NXP becomes the 11th member of the San Diego DX Club to get his WAZ. K6BHM was home on leave and attended the convention. Worked KL7MF recently and Hal asked his many San Diego friends to watch for him on 14 and 21 Mc., c.w., and phone. He is ex-W6MI/SIG. He became a grandfather this summer. The October meeting of the San Diego DX Club was held at the home of W6LRU. K6HQJ is now EC for 10 meters, replacing W6WYA who resigned recently. K6TXR is net control, and the net is called at 7 P.M. Tue. on 29.5 Mc. K6JPI, K6BPI, K6HQJ, W6KBT, W6EOT and W6PKZ participated in three different disaster alerts during September, aiding in two fires and one missing person hunt. Traffic: W6YDK 543, W6EOT 276, W6ELQ 92, W6SK 73, K6EQL 12, W6-

ISQ 3.

SANTA BARBARA—SCM, Robert A. Hemke, K6CVR—The Santa Barbara Radio Club had Woody Smith, from Gonset Company, give a talk on the Gonset GSB-100. The GSB-100 has some s.s.b. circuits worth looking into, W6BE recently received his Advance Class ticket. K6KPU sold his Viking mobile transmitter and got the Gonset Twins for his new mobile. It sure looks classy. K6DXW worked XE1NL, Mexico City, from his mobile rig running only one watt. K6CRJ is back on 10-meter phone with a Viking Adventurer and screen modulator. K6HAV has his Apache transmitter finished now and has been heard on 40 meters. Two new 2-meter stations in the Oxnard Area are W7UVH/6 and K6CNP. Traffic: K6BVA 16, W6FYW 5, W6YCF 3.

# WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX. PAMs: BOO and IWQ. RM: ACK. One thing I like better than to receive an invitation to a hamfest is to be able to attend. The San Angelo Club held its second with approximately 200 in attendance. I was impressed with K5CNB, EC for the County, and the civil defense group. Doc tells me there is an average of 16 stations checking in on the weekly drill-nights. W5NFO went to Tahoka to assist in organizing the Caprock ARC. IEB was elected pres.; K5LIB, vice-pres. There are ten charter members and a code and theory class already has been started. EPO has returned to Ft. Worth after a two-year stay in Japan. VEZ has completed his station set-up with a new 75A-4. ILF/5 is now active in Levelland. HZF is building a sideband rig. After reading the reports from the OOs I think more time should be spent reading the Handbook and FCC regulations than operating. There is a reason but no excuse for harmonics, key clicks and off-frequency operation. Many operators show their appreciation for notices by replying, others seem to ignore them. Better heed the warnings or the FCC will get you. Ft. Worth has an FB 6-meter net going with more than 50 checking in each week. BOO reports 30 sessions for NTO Net for September with 917 checking in and handling 272 messages. Ham Day at the Dallas Fair was a big success with more than 800 present. ETA, our Director, gave a fine talk on "What the ARRL means to You." Traffic: W5SMK 243, BTH 140, BOO 92, K5PXV 55, JSN 44, JBQ 23, DNQ 17, JZK 15.

JSN 44, JBQ 23, DNQ 17, JZK 15.

OKLAHOMA—SCM, Richard L. Hawkins, W5FEC—SEC: K5KFS. RM: JXM. PAMs: DRZ and MFX. Congratulations to BNU, K5BPV and VVQ on meeting the requirements for issuance of Sooner Traffic Net certificates. K5SIX and K50VF dropped the "N" from their calls. NS took the fatal step by adding the s.s.b. kit to his Apache. MRK received an IGY pin for his "Moonwatch" work. MMD added a kw. final to his rig. Preacher DRZ has the Sooner-Nooner Net going full blast on 7 Mc. He reports 20 sessions, 444 check-ins and 146 messages handled. K5CAY handled over fifty messages from Okinawa to the States. Congrats to K5JCB on his top score for Oklahoma in the CD Contest. Your SCM attended the ham day at the Texas Fair. K5EGS/6 is being worked by the Lawton hams on 29 Mc. K5KTW is being transferred to Tulsa. Remember, all hams are invited to check into the Oklahoma phone and c.w. nets whether or not you are ARRL members. Oklahoma's Ham of the (Continued on page 174)

# FOR THAT PERFECT CHRISTMAS GIFT... CHECK WITH ARROW'S HAM DEPT.!



Globe Sidebander DSB-100

Bandswitching 10-80M; 100W P.E.P. DSB input, suppressed carrier; 40W AM phone; 50W CW.

VOX Model 10. For voice operated control, with extra contacts for auxiliary circuits. Plug in socket at rear of DSB Xmtr. Adaptable for other Xmtrs. Kit - \$19.95 Wired & tested - \$24.95 QT-10. Access. for VOX. Wired. \$9.95



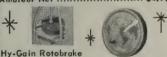
### Globe Scout 680A

TVI shielded, bandswitching 6-80M, with built-in power supply. High level modulation. Pi-Net output on 10-80 M; link-coupled on 6 M. 65 w CW, 50 w AM, plate modulated. New type, wide view shielded meter. Kit completed with all parts, tubes, pre-punched chassis and detailed instructions.

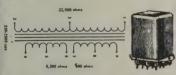
## Globe Code Oscillator Kit

Transistor and printed circuit assembly, Code Practice Oscillator, Screw terminal input for key; standard phone tip output jack. Kit complete with

Amateur Net ...... \$4.95



Complete rotating assembly including rotator, brake and wall-map indicator. Built to rotate and hold like the "iron without damage to beam. Amateur Net ...... \$149.95



# Versatile Miniature Transformer

Same as used in W2EWL SSB Rig -March '56 QST. 3 sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22,000 ohms. (By using the centertaps the impedances are quartered). The ideal transformer for a SSB transmitter. Other uses: in-terstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x 3/4" w. x 3/4" d. Brand new. Fully shielded.

Amateur Net, each ..... 3 for \$3.49 10 for \$10.75



# Hallicrafters Model S-38E

Broadcast band 540-1650 kc. 3 shortwave bands 1650 kc to 32 mc. Communications type controls for accurate tuning. Separate bandspread tuning control. Headphone tip jacks on rear. Built-in PM speaker. Oscillator for reception of code signals. Four tubes plus rectifier. 105-125 volts, 50-60 cycles AC-DC.

Amateur Net ......\$54.95



### National NC-60 Special

First all-new, low-priced, shortwave receiver in over 10 years. Continuous coverage of AM Broadcast, Amateur & World-wide shortwave bands with full electrical bandspreads on all frequencies, 540kc-31mc in 4 bands. 15 Amateur Net ...... \$59.95

# Cush Craft Blitz Bug Coax Cable Lightning Arrester

All new lightning arrester for standard coaxial cable. Designed to eliminate heavy static charge build-up. Protects valuable radio equipment. No insertion loss; will not affect performance or S/W/R, to 150 mc.

Amateur Net .......\$3.95



### "Wonder Bar" 10 Meter Antenna

As featured in Nov. 1956 OST. Complete with B&W 3013 Miniductor. Only 8 ft. long for 10 meters.

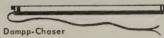
Transcon



Can be installed in any car radio rapidly. Tubes: 6AK5 & 12AX7. DC power input: 150 V. DC to 225 V. DC. Filament: 6 or 12 V. Noise Level Attenugtor: S2. Size: 21/4" x 21/2" x 4".

Amateur Net ...... \$12.95

Field Strength Meter. For both mobile or fixed station use ...... \$11.95



Reduces frequency drift. Protects your TX, RX, electronic equipment against moisture damage. The safe, efficient Thermo-Electric Dehumidifier chases moisture before it strikes. Never needs attention-refills, baking out or emptying. Complete with clips and instructions. Order longest size that will fit inside chassis. 24" attached cord solders to power SW terminals. Original

equipment in Hallicrafters SX-101.

Model 1E 12½" long, 8W. 117V. \$4.95

Model 3E 18½" long, 12W. 117V. \$4.95

### Sub-Miniature 0-200 Microampere Meter



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FAST SHIPMENT TO ALL PACIFIC POINTS Month: GOL for his many years of faithful participation and help in the traffic nets. Traffic: W5DRZ 223, K5CAY 180, W5ERI 145, K5DUJ 141, W5PNG 69, CCK 63, JXM 54, FEC 40, K5INC 39, W5KY 36, K5LGV 30, CBA 25, W5MFX 25, GOL 17, VLW 13, K5MBK 12, W5FKL 6, SWJ 5, EHC 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF, PAM: K5ZIN, RM: K5BSZ, MVL vacationed in New Mexico and attended the annual Carlada Diginia. He has up a Conset thirtean element 2.

vacationed in New Mexico and attended the annual Carlbad Picnic, He has up a Gonset thirteen-element, 2-meter antenna and keeps regular skeds with Alamogordo. LWP has a new shack with rigs for 160 through 2 meters. ES has a new Triband beam. MVL, the OBS at El Paso, sends bulletins at 0900 and 1900 MST on 3820 kc. and at 1915 MST on 144.018 kc. Listen for him at these times. KN5QFL worked portable from the Big Bend National Park with some Explorer Scouts. He handled traffic back to the parents in San Antonio, where KN5QJR was his contact. Congratulations to K5INT, new EC at Yoakum, for signing 7 members in 7 days there. He also has an agreement with the city and county governments for tie-ins with all their agencies. UXO is the new OBS at Village Mills. K5RYS is OPS at El Paso. New officers of the Galveston County Amateur Radio Club are DMM, pres.; K5OHA, vice-pres.; K5OHB, treas.; DJG, secy. K5OQN is the first station to get four 6-meter Century Club certificates. I believe this is a first for the nation, pres.; K50HA, vice-pres.; K50HB, treas.; DJG, secy. K50QN is the first station to get four 6-meter Century Club certificates. I believe this is a first for the nation, and all with only 6 watts. K50QN has been mobiling up in Yankee-Land. TKP has been working 6 meters with a 16-milliwatt transistor rig. He has had several contacts with K50QN over a four-mile path. Glad to hear FCX back on the air, The members of the Corpus Christi Amateur Radio Club would like to express their appreciation to all the stations, too numerous to mention, who were standing by during the Hurricane Ella Alert. There is a new net in Houston on 50.4 Mc. each Sun. at 9900. K50QN is net control and only AREC members will be answered. This is supervised by AIR the EC at Houston. K5MMV, Satsuma Valley ARC secy., says the club joined Hardin County folks in celebrating their 100th anniversary. Besides this call CQA/5 and K5HGZ/5 were in operation and K5LPE's circulars gave some 800 persons full data on Amateur Radio. Traffic: W5EGD 192, K5OEA 97, KN5QFL 96, QJR 96, K5-MZS 65, W5HKE 64, BVP 51, URW 37, FCX 27.

# CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCM: Aaron Solomon, IOC. SEC: AEB. Visits to two very active clubs, the SONRA (Society of Newfoundland Radio Operators), St. John's, Newfoundland, and SARC (Sydney Amateur Radio Club), Sydney, N. S., were made by your SCM early in October. Sincere thanks to the executives and members of these clubs for their kind welcome. VO News: The SONRA group has obtained a new club house and is running classes in code and theory for prospective amateurs. On-the-air meetings of the club are held the 3rd Sun. of every month on 7210 kc. at 10:10 A.M. NST. New appointments include VOICZ, who has accepted an Official Observer post. Don't forget the WAVO Award, now available. Details in Sept. 1958 QST. Copies of the rules are available from P.O. Box 2125, St. John's, Newfoundland. In v.h.f. news, WIZVH has a Gonset Communicator for 2 meters while VOIAO and W2ZRX now operate on 6 meters. Maritime ama-

2125, St. John's, Newfoundland. In v.h.f. news, WIZVH has a Gonset Communicator for 2 meters while VOIAO and W2ZRX now operate on 6 meters. Maritime amateurs were saddened by the passing of AO and RW. The Sydney Amateurs are progressing rapidly with their new club house. Piracy of amateur calls has shown a marked increase in recent weeks. Please be on the lookout for offenders and report any incident to this office. Traffic: VEIADH 30, AEB 11, DB 9, OM 4.

ONTARIO—SCM. Richard W. Roberts, VE3NG—AQE was in to see AVS. RH and PD, along with 2PW, visited EII. W80TK and W8WE were in to chat with AJR. 3DMX and 3FW also were expected. BUR is busy working 15-meter DX. BZB, mgr. of the OSN/PQN, reports that the net has a new name, the OQN. The Quinte group had an FB turnout in September. DPO is doing an FB job of editing and printing the GBARC club bulletin. The Ottawa ARC officers are W9SDP/VE3, pres.; CMW, vice-pres.; EBG, secy.; CDS, treas. The St. Clair Valley Club reports that member W8DPU worked Kurt Carlsen, W2ZXM/MM, on the new Flying Enterprise II in the Arabian Sea. The Scarboro ARC has elected the following officers: EBN, pres.; ASE, vice-pres.; EMX, secy.; Sid Prior, treas. DFA and DFC have a new beam. CNA is on 40-meter c.w. The Ottawa Valley Mobile Club is now affiliated with the ARRL. Welcome, gentlemen. If I can help, drop me a line. The Soo boys report they had an FB meeting with the SEC (KM). DYR has a quad. EOV and EOW have new WAS certificates. How about some appointment certificates, lads? Write to your SCM for information. Any appointees who have forgotten to send in certificates for endorsement should do so as soon as possible. The Toronto gang (Continued on page 176)

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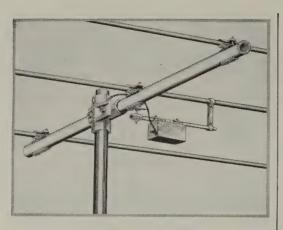
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13L-26RGX	2-6	8-5	65.00
2L-20RG	20	2	67.50
3L-20RG	20	3	107.50
5L-20RG	20	5	225.00
3L-15RG	15	3	65.00
5L-15RG	15	5	157.50
3L-10RG	10	3	55.00
5L-10RG	10	5	107.50
3L-6RG	6	3	37.50
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# TENNALAB

QUINCY, ILLINOIS

was disappointed when the National Air Show was all but cancelled, Under DSM they were to assist in the control (communications) of the Governor General's Cup

was disappointed when the National Air Show was all but cancelled, Under DSM they were to assist in the control (communications) of the Governor General's Cup Race. Bad weather prevailed. AJA was a visitor to Kapauskasing. ELC is back in Toronto. ARF and DVM are back in Bowmanville for the winter. DUU has recovered from his hand injury. RH and TX are the new PAMs. Traffic: VE3BUR 77, NG 75, AUU 70, NO 67, DPO 65, EII 65, BZB 55, EBB 49, DTB 44, DEX 32, CHF 31, EIK 30, DUU 25, KM 24, AJR 23, AML 22, BH 20, BOY 20, ELC 16, DOC 11, CE 10, ELU 9, DSM 7. QUEBEC—SCM, C. W. Skarstedt, VE2DR—OQN, the c.w. net, meets daily on 3535 kc. at 1900; the Quebec Fone Net daily on 3780 kc. at 1845. The MARC sponsored a successful "Rally." An outstanding attraction proved to be a hidden transmitter hunt. A young chap, Eric Lloyd, posed as a beautiful girl and carried a transmitter hidden in a handbag with a mike (a la Dick Tracy) strapped to his arm. He was accompanied by another smart lady who took care of the power supply. These two "ladies" really had the searchers buffaloed. This clever trickery received prominent space (plus pictures) in the local press. VE3UY won the 80-meter hunt while ASW copped the first part. MW did a good job as chairman, assisted by TA, HI, AZT and MB. DU was M.C. and W1BUD, from Headquarters, was guest speaker. VV deserves great praise for amassing such fine prizes. As usual Jean (Mrs. BB) worked hard. The rally was well attended by out-of-towners. General News: ACD received phone endorsement. AWK now is ready to apply for WAC. ARH works 144 Me. VESAT attended the rally and passed on interesting information re VES-Land. K2QJL visited ATL. 7QR, while on a 'round-the-world trip, visited XX. AKY now is GZ. IK was VE3AAS. WT, from Joliette, is on 20 meters. AWV is striking DX gold with a quad on 10, 15 and 20 meters. The St. Maurice Valley Club holds regular monthly meetings and is setting a good example by planning now for 1959 Field Day.

WT, from Joliette, is on 20 meters. AWV is striking DX gold with a quad on 10, 15 and 20 meters. The St. Maurice Valley Club holds regular monthly meetings and is setting a good example by planning now for 1959 Field Day. Ham TV in the Montreal Area is supported by AZT, AKT, JF, AFM and LS. Traffic: VE2DR 133, EC 28.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—SEC: KX. Thanks to EV for his Northern news. ADM is boning up on TV so they can modulate a milk bottle in Dawson Creek to keep the people happy when they get snowbound in the winter. XY has a new house and has chopped holes, etc., for antennas through the new woodwork but eventually he will be back on. AN also is house-building. AKS and EV still are active on some bands. MG is back in Alberta. AD is the new net manager of the BCEN on 3850 kc. Mon. through Fri. at 2000. The gang on 3650 kc. will gladly welcome anyone who wishes to handle traffic. AAF reports that XD and AER are doing a good job on the VSWC paper, Zero Beat. I'm sorry to say I have never seen a copy. The gang in Nanimo still turns out a paper with the best veiled invectives that I have read in a long time. Keep it up, fellows, and hope you send the paper where it will do the most good. TF and AD, along with other faithfuls, have the BCEN going strong, with VE5s and 6s now checking in. New ORSs are AD, AAF, AEC and AOI. There are others who could hold appointments if they were ARRL members. NJ, in Victoria, still is battling QRN. A large chain or a .22 might help, Frank. Hope you all have a Merry Christmas and a Happy New Year. Traffic: VE7TF 93, AAF 15, FS 14, AD 10, AC 4, AEC 4.

MANITOBA—SCM, James A. Elliott, VE4IE—Highlights of the month were a hidden transmitter hunt, a scavenger hunt and a weiner roast sponsored by the ARLM. Attendance was high and the gang had a fine time. A Smorgasboard is planned for November, which will be the windup for the year. A successful civil defense exercise was held Sept. 19 in which many of the local mobiles participated. Congratulations to TA on win

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Dual conversion on all bands. Crystal controlled 2nd converter oscillator. Giant, slide-rule dial with ten dial scales covers 160 to 11/4 meters, easily readable to 2 kc without interpolation up to 21.5 mc. Exclusive converter provision for 6, 2 and 11/4 meters. Separate linear detector for SSB, will not block with RF gain full open. Giant "S" meter. Provision for external control of RF gain automatically during transmitting periods. Muting provision for CW break-in operation. Socket for plug-in crystal and WWV calibrator. Accessory socket for powering converters and future accessories. Fifteen tubes including rectifier. Less than 1 microvolt sensitivity with 70-ohm dummy ant, and 10 db sig/noise.

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# "SimpleX Super" Receiver

(Continued from page 14)

forth with the b.f.o. turned off; you should find a spot where the noise rushes up quickly and then drops off. This is the crystal frequency, and  $L_3$  and  $L_4$  should be peaked again on this frequency if you were a little off the first time.

An antenna connected to the receiver should now permit the reception of signals. With  $C_1$ nearly unmeshed, you will be in the region of the 7-Mc. band, and with  $C_1$  almost completely meshed, you will be near 3.5 Mc. Do your tuning with the compression trimmer in the oscillator circuit, until you find a known frequency (it can be your own transmitter). Let's say your transmitter has a crystal at 3725 kc. Set C2 at half capacitance and tune with  $C_6$  until you hear your transmitter. You shouldn't need any antenna on the receiver for this test. Once you have the setting for the trimmer, put the antenna on the receiver and look around for other known signals. (CHU, the Canadian standard-frequency station at 7335 kc., is a good marker.) With luck you should just be able to cover the 80-meter band: if you can get one end but not the other, a minor readjustment of the trimmer is indicated.

Once you have acquainted yourself with the 80- and 40-meter bands, and appreciate that you have to peak up the input circuit  $(C_1)$  fairly often as you tune across the bands, you are ready to trim up the crystal filter. Run the volume fairly high, so that you can hear noise from the properly-peaked input circuit, and turn  $C_3$  until the noise takes on a higher-pitched characteristic. (The b.f.o. stage is originally set up with  $C_3$  at midcapacitance and  $L_5$  adjusted for lowest-pitched noise.) Now tune in a code signal with  $C_2$  and swing back and forth through it. "One side" of the signal should be louder than the other. Tune to the weak side with a beat note of around 800 cycles and then adjust  $C_4$  for minimum signal. After a few attempts, juggling  $C_3$ ,  $C_4$ ,  $L_3$  and  $L_4$ , you should get a condition where the single-signal c.w. effect is quite apparent.

All that remains is to install the dial scale and calibrate it. A 100-kc. oscillator is ideal for this job; lacking one or the ability to borrow one, you will have to rely on other signals. If your crystal filter is 1700 kc. exactly, the 80- and 40-meter calibrations will coincide as they do on the receiver shown in the photographs; if not, the calibration marks will be offset on the two bands.

If you find that you can't get WWV at 5 Mc. with the 150- $\mu\mu$ f. capacitor switched in, it is no cause for alarm. Simply substitute a 130- $\mu\mu$ f. mica in parallel with a 30- $\mu\mu$ f. compression trimmer, and adjust the trimmer so that WWV falls on scale.

# Performance

As you acquaint yourself with the operation of the receiver, you will notice that tuning  $C_1$  will have a slight effect on the tuning of the signal.

(Continued on page 180)

HOT FOR 6 AND 2!



COBE HERANDER

55 Watts AM phone, 60 Watts CW input on both 6 and 2 meters

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VFQ 5-2



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In other words, tuning  $C_1$  "pulls" the oscillator slightly. To remedy this would have made the receiver more complicated, and the simple solution is merely to first peak  $C_1$  on noise and then

You will find this to be a practical receiver in every way for the c.w. (or s.s.b.) operator. The tuning rate is always the same on 80 or 40, or 15 with a converter and 21-Mc. s.s.b. signals tune as easily as those on 3.9 Mc. The warm-up drift is negligible, and the oscillator is surprisingly insensitive to voltage changes. Whether or not the oscillator is insensitive to shock and vibration will depend upon the care with which the components are anchored to their respective tie points.

(Yes, Virginia, there is a Santa Claus. But there is no known way to add an S meter, a.v.c., noise limiter or Q multiplier to the SimpleX Super without additional tubes or semiconductors.)

### Wide-Band Dummy Loads

(Continued from page 23)

### Appendix

The possibility of wide-band compensation of slightly inductive resistors with shunting capacitors is shown in the following way:

1) Assume a resistance  $R_s$  in series with an inductive reactance X<sub>s</sub>.

2) The parallel equivalent of  $X_s$  is

$$X_{\rm p} = \frac{R_{\rm s}^2 + X_{\rm s}^2}{X_{\rm s}}$$
 3) If  $X_{\rm s}$  is much less than  $R_{\rm s}$ ,

$$X_{\rm p} = {\rm approximately} \, rac{R_{
m s}^2}{X_{
m s}} = rac{R_{
m s}^2}{2\pi f L_{
m s}}$$

4) Where an inductance is paralleled with a capacitance, neither appears to be in the circuit when the capacitive reactance is equal to the inductive reactance. Thus the condition for cancellation of the inductive effect occurs when the parallel inductive reactance  $X_p$  equals some parallel

capacitive reactance  $X_{c}=\frac{1}{2\pi f C}$  , which is another way of saying

$$rac{R_{
m s}^2}{2\pi f L_{
m s}} = rac{1}{2\pi f C}$$
 or  $rac{R_{
m s}^2}{L_{
m s}} = rac{1}{C}$ 

5) This last expression has no frequency term in it, showing that a small inductive reactance can be nearly eliminated at all frequencies by a single fixed capacitor.

### Technical Correspondence

(Continued from page 44)

band components produced by the telemetry frequencies. As these frequencies are rather closely spaced to the carrier frequency and each other, the result is the generation of at least two complete sets of spurious frequencies plus the original beat frequency, all of which are continuously changing from doppler shift and/or receiver instability.

If, in addition to this, harmonic distortion is present within the receiver or tape recorder, then to add to the existing woes a second-order collection of intermodulation products appears in the output. The result is similar to the search for a needle in the haystack" with the needle being periodically moved.

Having rather thoroughly covered the dark side of the

(Continued on page 182)

# Meet the Miniature Mini-Tribanders

WITH SINGLE FEED LINE FOR MAXIMUM LEGAL POWER!

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These streamline hy-gain traps are small (3" diameter) and light weight. Capacitor dielectric and coil form molded high impact styron. Each designed to take 1 KW AM, 2000 watts P.E.P. (as much as higher priced tribanders; more than 3-times the power handling capabilities of others. No need to limit your present or future power to 300 watts!) Individually factory resonated for maximum frequency accuracy. Completely weather sealed, water proof and airtight (do not breathe) for years of stable operation. Carbon activated polyethylene covers. Guaranteed for the life of the beam. Hi-Q coils well-removed from any metal mean highest efficiency of isolation action.

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picture a few positive thoughts on the subject might be appropriate. A few suggestions are given to minimize the difficulties that have arisen from the existing recording procedures.

Receiver tuning procedures may be somewhat different depending upon the type of modulation used in the transmitter. If the transmitter is frequency modulated, the f.m. receiver should be centered on the carrier as in standard tuning procedures, either by using the telemetered signal for tuning or, preferably, a stable reference oscillator whose frequency calibration is known accurately.

In the case of the amplitude modulated transmission, two approaches are possible. First, the receiver may be adjusted so that its band width is sufficient to receive both sets of sidebands with little attenuation. An alternate procedure would be to operate the receiver more or less as a single-sideband system with a band pass adequate to accept the carrier frequency plus one set of sidebands, with due allowance for doppler shift. In either case, crystal filter operation of the receiver is inadvisable unless the filter rejection peak is well outside the carrier or highest sideband frequency.

If at all possible a crystal reference oscillator is advisable for tuning purposes. No adjustments whatsoever should be made to the receiving equipment during a satellite pass, with the possible exception of a quick tuning check during the maximum signal condition if a good reference oscillator is not available. One reason for this is that certain types of data-reading equipment—for instance, a wave analyzer—may be sensitive to changes in the noise spectrum as caused, for example, by receiver tuning.

In many cases telemetry signals which may not be at all audible may be translated quite readily. If the presence of the carrier is indicated by an increase in the receiver noise. valid telemetering information may be present and recording should be started at this time. Assuming the receiving system is properly adjusted to pass the carrier and sideband components, the audible signal-to-noise ratio is determined by these adjustments. However, this is not the signal-tonoise ratio as viewed from the standpoint of an individual telemetry channel, which is much more narrow than that of the receiving system as a whole. As a result, the signal-tonoise ratio of the individual telemetry channel is improved by a factor equal to the total receiver band width divided by the telemetry filter band width. This improvement factor in itself is adequate to make an apparently useless signal easily readable. In addition, it is not difficult to read at least 20 db. below the noise existing within the filter band width by employing a technique no more complex than an oscilloscope whose vertical input is the telemetered signal and whose horizontal input is an external audio oscillator. The technique, of course, is that of frequency measurement of the subcarrier oscillator by zero-beating the reference oscillator. The approach is both simple and reliable and has been used in reading many data tapes. This method may be satisfactorily employed even without the use of bandseparation filters for the various telemetry channels.

The final data interpretation from both amateur and professional tape recordings is highly dependent upon an accurate knowledge of the time at which the recordings were made. The signal strength at each receiving station varies greatly between various satellite passes as well as during a single pass. It is necessary, therefore, to analyze the data from several stations which may be receiving the signal approximately at the same time. If the recorded time is not known for each station, the data may be incomplete, confusing, or even worthless. In general, this requirement has been recognized by amateurs who have participated in this program.

Various methods of recording time have been used by amateurs. One amateur handled the problem by switching from telemetered data to WWV for the five-minute voice and code announcements and also for a few seconds' break for each one minute mark. This method, while excellent, generally requires the use of a second receiver. An alternate method that should be quite good would be the accurate setting of a clock or watch to WWV before the satellite pass, and voice recording the time for each minute and five minute period. A third possibility would be the recording of time in code by either an accurate 400-cycle oscillator or the 60-cycle a.c. line. In either case, the start of the minute would be indicated by a five- to ten-second dash following the code announcement. The use of either an accurate 400-cycle or 60-cycle frequency has the additional merit of providing a check on the exact speed of the recording and reproducing

(Continued on 184)

<sup>\*</sup>marked for intermediate frequencies.



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equipment. A worthwhile modification of the above idea would be to continuously record the selected tone at a low level and amplitude key its level for code recording. If possible, the time error should be held to less than one

The above information is not meant to discourage the efforts of those who have undertaken measurements of the satellite transmissions but merely to point out possible improvements which might be made in the receiving and recording of data. This laboratory is well aware of the major contributions which the amateur fraternity has made to science. We have the greatest respect for their efforts and results, and fully expect that their contributions to future technology will be equally great.

The writer wishes to express his appreciation to Messrs. N. W. Mathews of the Naval Research Laboratory and L. N. Cormier of the National Academy of Sciences for their comments and suggestions.

- Frank K. Dearborn. Project Scientist

### **Technical Topics**

(Continued from page 35)

loss. But in order to make computations similar to those above it would be necessary to have tube data covering simultaneous swinging of the control grid and screen at r.f. while using negative bias on the control grid and positive bias on the screen. It is well-nigh impossible to extract the necessary information from currently-published tube characteristics and curves. A meagre amount of operating data has accumulated, all based on amateur experience with particular amplifiers, but practically none of it is quantitative in the sense that it can be used for design purposes.

### **Screen Protection**

Stephen Goch, K2IVB, has pointed out some disadvantages of the screen protective system shown by W4SUD in his circuit on page 36 of the August issue. As K2IVB states, when the contacts of  $K_1$  break as a result of overload, the winding of the relay will be de-energized and immediately close again, resulting in a "buzzer" action. It is also pointed out that during the time the relay contacts are open, the 1000- $\mu\mu$ f, capacitor below the relay and the relay are at full d.c. plate potential above ground and should be insulated for at least this value.

One possible remedy for the "buzzer" action would be the substitution of a double-throw relay with a resistor connected between the back contact and ground. This resistor should have a value such that it would draw sufficient current to keep the screen contacts open. The relay contacts would return to normal position upon removal of plate voltage. — Ed.

### Strays 🐒

K2SRK tells us that K2YEA has a parakeet which learned to whistle the code during the course of some code practice sessions at K2YEA's.



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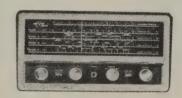


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### Recent Equipment

(Continued from page 43)

the form of a color-coded harness. Nevertheless, the remainder of the job will constitute a task approaching 50 hours. This time can be easily doubled if you don't follow the instruction-book suggestion to sort out all of the parts before starting the assembly. There is a multitude of small components and pieces of hardware and, if you don't set up some sort of system for yourself, you'll be spending most of your time hunting for the right combination of screw, lockwasher and nut — there are several sizes of each. (Furnished with the kit is a soft plastic nut starter which is the slickest gadget we've seen for fishing a nut onto a screw in a tight place.) You will find it well-nigh impossible to make many of the connections with the standard 100-watt soldering iron with 1/4-inch tip; a miniature iron with a 1/8-inch tip is essential. As usual, most of the small components are clustered around the miniature sockets and it will pay you to make a close examination after each soldering operation to make sure both that the soldered joint is secure and that there are no shorts. Running down a poor connection or a short circuit after the assembly is complete is likely to be an exasperating chore, since many of the terminals will be hardly accessible to test, or even examination. Particular care should be used in mounting the selectivity switch, because there is very little clearance above the many exposed terminals of components already mounted and wired below the switch (as viewed from the bottom). Also, take a close look at the switch-assembly sketch or you may be putting on the last component when you discover (as the writer did) that you have the whole business reversed!

The dial, which the constructor assembles, has a combination of four gears to drive the tuningcapacitor gang. Two of these gears are of nylon to assure smooth operation and long wear. Another is a spring-loaded split gear to minimize backlash. The pointer for the slide-rule dial is string-driven from a large pulley on the tuningcapacitor drive shaft. String drive is also used between a pulley on the band-switch shaft and the dial-scale drum. The calibrated slide-rule dial scale is 10 inches long and has a calibration mark every 5 kc. on all bands. Each band occupies essentially the full length of the scale. (The tuning range for use as i.f. for the 6- and 2-meter converters which Heath plans to produce shortly is 24 to 28 Mc.) It takes 14 turns of the tuning knob to cover each tuning range. Operators who are accustomed to a weighted free-spinning tuning knob will have to get acclimated to the Mohawk; those who have operated Collins receivers will be right at home.

#### Alignment

The designers have devised a way of making an accurate alignment without the need for instruments. Preset trimmers are furnished to pad temporarily the 14-Mc. range so that 10-Mc.

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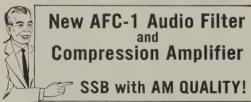


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signals from WWV can be used to set the crystal calibrator accurately to 100 kc. From then on, either the calibrator itself or the b.f.o. (calibrated from the calibrator) is used as a signal generator, with the S meter as an indicator. The front end is prealigned and requires no adjustment.

The instruction book is quite complete and anyone who will follow the step-by-step procedure carefully should have no trouble in ending up with a very satisfactory communications receiver. The chassis, panel, cabinet and other mechanical components are not flimsy. With the two panel brackets in place and the receiver in its heavy perforated cabinet, frequency stability under mechanical stress is good. Effects of temperature and humidity have been minimized by the use of ceramic insulation, including coil forms, throughout the high-frequency circuits, and by the crystal-controlled oscillators in the first converter.

The unit measures  $19\frac{1}{2}$  inches wide,  $11\frac{5}{8}$ inches high and 16 inches deep. It weighs 52 pounds, and draws 75 watts from the line.

-D. M.

### Field Day Results

(Continued from page 64)

#### CLASS E

Grouped in this tabulation are the scores of home stations operated from commercial power sources.

 $^1$  W9s DSP GDW, oprs.  $^2$  2 oprs.  $^3$  W8s HXB IAU, oprs.  $^4$  W2EZJ, opr.  $^5$  W6HBF, 2nd opr.  $^6$  KNøMFV, 2nd opr.  $^7$  4 oprs.  $^8$  W9ASG, 2nd opr.  $^9$  9 oprs.  $^{10}$  W2SSC, 2nd opr.  $^{11}$  K2LQU, 2nd opr.  $^{12}$  3 oprs.  $^{13}$  6 rigs, 25 oprs.  $^{14}$  3 rigs, 12 oprs.  $^{15}$  5 rigs, 23 oprs.  $^{16}$  2 rigs, 9 oprs.  $^{17}$  2 rigs, 2 oprs.

### Hints and Kinks

(Continued from page 71)

The neon indicator is then capacity-coupled to the tank coil by soldering a piece of insulated wire to the base of the bulb and bending it so that it is near to, but not touching, the coil. The amount of coupling may be changed by varying the distance between the wire and the coil until the desired brilliance is attained.

This modified coupler is being used at KN3BZI to load a new 40-meter vertical and the results indicate that the modification was well worth the little effort involved.

> — Walter J. Bannister, KN3BZI Walter J. Stauffer, jr., KN3DWY

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(Includes complete set of coils for full band coverage.) Exceptionally versatile. Excellent absorption wave meter. Ham uses; pre-tuning and neutralizing xmitters, uses; pre-tuning and neutralizing xmitters, power indication, localing parasitic osc., antenna adj., correcting TVI, de-bugging with xmitter power off, determining C, L, Q. Easy to hold and thumb-tune with one hand. Continuous 400 KC-250 MC coverage in 7 ranges, pre-wound 0.5% accurate coils, 500 //a meter movement. 6AF4(A) or 6T4 Colpits osc. Xmfr. operated sel. rect. 21/4" H, 2-9/16" W, 6%" L.

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### I.A.R.U. News

(Continued from page 65)

Philippine Islands: Elpidio G. DeCastro, Philippine Assn. for Radio Advancement, 2046 Taft Ave., Pasay City Poland: PZK QSL Bureau, P.O. Box 320, Warsaw 10 Portugal: Rua de D. Pedro V., 7-4°, Lisbon Roumania: A.R.E.R., P.O. Box 95, Bucharest Saar: P.O. Box 310, Saarbrucken Salvador: YS1O, Apartado 329, San Salvador Singapore: via Malaya South Africa: S.A.R.L., P.O. Box 3037, Capetown Southern Rhodesia: R.S.S.R., Box 2377, Salisbury Spain: U.R.E., P.O. Box 220, Madrid St. Vincent: VP2SA, Kingstown Sweden: S.S.A., Stockholm 4 Switzerland: U.S.K.A., Knutwil Syria: P.O. Box 35, Damascus Trinidad: John A. Hoford, VP4TT, Box 554, Port-of-Spain Tunisia: Francois DeVichi, 5 Rue Can Robert, Tunis Uganda: P.O. Box 1803, Kampala Uruguay: R.C.U., P.O. Box 37, Montevideo U.S.S.R.: Central Radio Club, Postbox N-88, Moscow Venezuela: R.C.V., P.O. Box 2285, Caracas Virgin Islands: Richard Spenceley, Box 403, St. Thomas Wake Island: T. D. Musson, P.O. Box 127 Yugoslavia: S.R.J., Postbox 48, Belgrade

### Correspondence From Members

(Continued from page 94)

the best group of OM and YL Technicians you could ask for plus the fact we have the largest and most efficient emergency net (Tarrant County Six Meter Emergency Net) that has ever been in this part of the country; past, present and probably future. - Eddie Kuykendall, W5UXP

> 23305 Churches Road Detroit 41, Michigan

Editor, QST: The "Video Ranger" is your responsibility. The FCC has authorized you to officiate at his license test and check his code speed to see if he will qualify as a Technician. If there are any Technicians operating at the present time who are not qualified, or lack the knowledge of c.w. (5 w.p.m.), or are ignorant of our amateur radio laws, it is because some one of your own class proved himself not qualified to perform this important task in the first place.

My suggestion to all of the General and Advanced Class operators is this: clean your own house first, instruct the Technician applicant of his obligation at the time you officiate at his test. Don't give the applicant the benefit of any doubt; conduct an honest test. This may keep the "playboy" off our 50-Mc. band and leave room for some serious Technicians to pursue their radio hobby to its extreme. - George Squires, W8SDK

### DXCC

Mullin Lane Wilmington 3, Delaware

Editor, QST:

I think it would be nice if we had DXCC for all c.w. DXCC for all a.m. phone, DXCC for all single sideband, and DXCC for all single-handed.

- Joe Gillson, W3GAU

### ORU?

Box 485, Linfield College McMinnville, Oregon

Editor, QST:

Are people who check into nets with negative traffic engaged in some sort of a business like selling short in the - Ed G. Dolan, K7AAW stock market?

### **FEEDBACK**

In "An All-Electronic Key and Keyer," by Jack Livingston, K2POO, October 1958 QST, on page 28,  $L_1$  should be listed as a Stancor A3850 or equivalent.



IMPORTANT NEW BOOKS

UNDAMENTALS OF TRANSISTORS (2nd edition) by Leonard M. 'rugman, P.E. This, the second edition, (revised and expanded) todernizes the highly successful and popular first edition, so as a mbrace the latest developments in the transistor art. #160, 3.50

-C CIRCUIT ANALYSIS (Electronic Technology Series) edited y Alexander Schure, Ph.D. Fundamental concepts of alterating current made completely understandable. Comprehensive athematical treatment. #166-19, \$1.80.

ONDUCTANCE DESIGN OF ACTIVE CIRCUITS by Keats A. Fullen, Jr., Eng.D. The non-linearity of electron tubes and cansistors has for many years greatly complicated the design of ctive circuits associated with these devices. This book presents proven method of overcoming these complications. It presents he conductance technique as applied to the design of a wide ariety of vacuum tube and transistor amplifier, mixer and osciltor circuitry, in the broadest sense. #207, Cloth Bound, \$9.95.

BASIC PULSES by Irving Gottlieb, P.E. Pulses are vital in every area of electronics-computers, radar, industrial, television. This 'picture-book' course covers the nature, measurement and application of pulses. #216, \$3.50.

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Series) edited by Alexander Schure, Ph.D. Provides an extremely comprehensive discussion on vacuum tubes, their constants and characteristics making the fundamentals of vacuum tubes completely understandable. #166-22, \$1.80.

HOW TO TROUBLESHOOT A TV RECEIVER (2nd edition) by J. Richard Johnson. The second edition of this highly popular book has been expanded and brought up-to-date. Shows how to pinpoint troubles in all types of TV receivers and how to repair them easily and quickly. #152, \$2.50.

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BASIC ELECTRICAL POWER DISTRIBUTION by Anthony J. Pansini, P.E. #187, 2 vols., soft cover, \$4.80 per set.

BASIC VACUUM TUBES AND THEIR USES by Rider & Jacobowitz. #171, soft cover, \$3.00; #171H, Cloth Bound, \$4.50. UNDERSTANDING VECTORS & PHASE by Rider & Uslan. #103,

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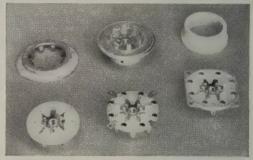
# • New Apparatus

# Johnson Sockets for External Anode Tubes

A CONSIDERABLE item of expense in the construction of equipment using external-anode tubes such as the VX150A and 4X250B is the socket required. Because of the special by-passing and cooling problems encountered with these tubes, a socket suitable for them is necessarily somewhat complex and costly. A new line of sockets introduced by the E. F. Johnson Company offers amateurs opportunities for savings in certain applications for tubes of this type.

One convenient form, the 124-107-1, lower right, consists of the basic socket in a lightweight silver-plated mounting saddle. The cathode terminals are insulated from ground. The No. 124-108-1, not shown, is similar except that the cathode terminals are inherently grounded.

The simplest and least expensive socket is the No. 124-109-1, shown at the lower left in the photograph. This is the basic socket only, without the mounting saddle, and with no provision for grounding the cathode terminals automatically when the socket is mounted in place. This



Johnson sockets for external-anode tetrode tubes are available in several forms. By-pass assembly, upper left, and chminey, right rear, may be added as accessories.

part is built into the No. 124-110-1 assembly, upper center, which includes a low-inductance 2700- $\mu\mu$ f. by-pass capacitor in the silver-plated housing. Spring tabs contact the screen ring of the tube at eight points. This complete assembly is available with insulated or grounded cathode terminals, Numbers 124-110-1 and 124-112-1, respectively. The latter is not included in the picture.

Part No. 124-113-1, upper left, is a separate by-pass capacitor assembly for use with the 124-107, 108, 109 and 144-1 sockets. Its built-in screen bypass has a capacitance of 1450  $\mu\mu$ f., tested at 1000 volts d.c. The No. 124-114-1, lower center, is the same as the 108, except that it has the low-inductance grounding on the cathode terminals, Pins 2, 4, 6 and 8.

A chimney of heat-resistant steatite, No. 124-*Continued on page 194*)



Only seven years ago Gene Chmielewski was just another amateur 'ham' working out of Bayonne, New Jersey. Today, Gene is a successful Senior Field Engineer directing a team of Philco TechReps now installing and maintaining a new multi-million-dollar radar facility in Montana.

Besides monitoring just about every phase of this operation, Gene is concerned with the evaluating, modifying and installing of new radar gear; establishing equipment reliability; co-ordinating the efforts of the project groups under his supervision; maintaining adequate liaison with the home office; and handling a myriad of managerial problems that crop up daily. Obviously, Gene has come a long way since 1951. Let's look at his record.

Starting at rock bottom as a Maintenance Specialist, he quickly displayed the initiative and ability that have earned him his responsible assignments. Philco made available to him, as it does to all TechReps, the

ELECTRONICS: Communications, Radar, Sonar, Navigational Aids, Guided Missiles, Antenna Systems, Microwave, Computers, Telemetering, Technical Writing

**ELECTROMECHANICAL:** Power Distribution, Diesel Generators, Electrical Controls

**TELEPHONE:** Central Office, Installers, Traffic Engineers, Switchboard, Outside Plant

most advanced correspondence courses on electronics yet developed by industry for free distribution to its qualified employees. Thus adding to his practical electronics know-how, Chmielewski advanced speedily from Maintenance Specialist to Maintenance Engineer and on to Field Engineer, before his elevation to Senior Engineer. Other promotions to Project and Group Engineer lie ahead.

Gene is one of more than 3,000 engineers and technicians assigned to vital electronic installations throughout the free world. These TechReps, performing engineering and maintenance services on worldwide communications systems, early warning radar networks, field testing and instrumentation of offensive/defensive missiles and systems, are already on the ground floor of tomorrow's important satellite programs. As with other TechReps, Chmielewski's stateside and foreign assignments have led him into areas and avenues of interest seldom explored by desk-bound engineers.

If your professional interests, experience and ambitions are in electronics you may find — as Eugene Chmielewski did — a fascinating career as a TechRep.

Engineers and Technicians, AT ALL LEVELS, are invited to investigate the many openings now available. For an interview in your city and a copy of our full color booklet — "PHILCO . . . FIRST in Employment Opportunities,"

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111-1, right rear, is available for use with these and other types of sockets. It directs the air flow through the fins in the external anode assembly, for most effective cooling.

This choice of socket assemblies and components makes possible the use of the simple and relatively inexpensive basic sockets for many applications where the by-passing ring and other features of the complete assemblies may not be required. Examples would be audio equipment and r.f. uses where extremely low-inductance screen by-pass leads are not vitally important.

- E. P. T.

### The Cushcraft 2-Meter Halo

With horizontal polarization in general use through nearly all of the United States, the operator of a 2-meter mobile station must go to a horizontal antenna of some kind if he is to achieve maximum coverage. The 144-Mc. halo by Cushcraft \* makes this easy.

The halo is solidly built, and should stand the rigors of mobile operation indefinitely. The radiating element is ½-inch tubing, with closed ends. The block by which it is mounted (to a support ½ inch in diameter) is solid aluminum, equipped with heavy set screws.



The feedline may be coaxial line of any size or impedance. Matching is by means of a coaxial variable capacitor and an adjustable clamp between the capacitor arm and the driven element. The position of the gamma clamp is set for 52 ohms at 145 Mc., at the factory, but readjustment for other line impedances or different operating frequencies is a simple matter if one has an s.w.r. bridge. The 145-Mc. setting is close enough for good operation over at least the lower half of the band.

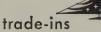
— E. P. T.

\*Cushman Products, 621 Hayward St., Manchester, N. H.

### Miniature Components

As PART of a program of miniaturizing standard components that have been part of the line for many years, the James Millen Manufacturing Co., Malden, Mass., has added extensively to its catalog of miniature parts. Some of the new (Continued on page 196)





allow you more for Christmas giving. So select the finest while you save ... give Hallicrafters

SX101 MARK III—IT'S ALL AMATEUR—Full ham coverage. 160-10 meters. Slide rule dial with 40:1 tuning knob ratio. Full gear drive from turning knob to gang condenser. Built-in 100 kc. crystal calibrator. Precision temperature compensation plus heat cycling for lowest drift, second conversion oscillators crystal controlled. Sensitivity—one uv or less. Dual conversion, exclusive upper-lower side band selection . . . 5 steps of selectivity, 5 kc to 500 cycles at 6 db down. Teenotch filter for heterodyne reduction. Finished in satin black and light gray. Less speaker. 395.00 98F037. NET. SX101 MARK III-IT'S ALL AMATEUR-Full ham

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H132—SSB-AM AND CW XMITTER—80-10 meters, Gear driven VFO with vernier calibration—200 cycles all bands, plus crystal controlled high freq. heterodyne oscillator. 5 mc crystal filter suppresses unwanted sideband 50 db or more. On AM both sidebands are transmitted. Built-in voice control system. Full TVI suppression, filtering for control circuits and AC power line. 2—6146 final output tubes—144 watts input P.E.P. 52 ohm pi network output. 20" W x 10½" H x 17" D. Shpq. Wt. 86 lbs. 98F043. NET. HT32—SSB-AM AND CW XMITTER—80-10 meters,



HT33A LINEAR AMPLIFIER—Conservatively rated 1 kw. Ideal companion unit for HT-32. A PL-172 pentode operating Class AB1 provides excellent stability, higher efficiency and greater overload capacity. 50-75 ohm resistive input requires no tuning or neutralization. One knob bandswitching 80 thru 10 meters. Metered circuits include grid, screen, cathode current—plate voltage, R.F. output tuning indicator. Special fan insures cooling. Variable pi network output. Size 10½"H x 20"W x 17"D. Shpg. wt., 130 lbs. 795.00



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S-38E WORLD WIDE RADIO-For foreign and domestic shortwave broadcasts, amateurs, police. amateurs, police, ships. Built-in aircraft and ships. Built-in speaker plus tip jack for head-set listening. Frequency coverage .54.32MC. 98F045. NET 54.95



MODEL R-47 SPEAKER - Matching 4" communication speaker for all Hallicrafter receivers. Has 3.2 ohm speaker output. Response 300 to 2850 cps. Size: 5½x5½x5½x3½'. Shipping Weight, 2½ lbe 2½ lbs. 98F046. NET.....

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MODEL 130 FOR 120 to 130 WATTS — NOW \$169.50

MODEL 242 FOR 6 METERS OR 2 METERS—45 WATTS INPUT—6146 FINAL Complete with mobile connections, A.C. power supply, tubes, xtal. Xtal mike input. Uses 8 mc. xtals or Lettine VFO. Swinging link matches 52—300 ohm antennas. Same cab. as 240, 889,95.

TECHNICIANS! The 6 meter 242 is your ideal transmitter, designed especially for 6 meters. Check these features. 45 to 50 watts input. Three RF stages with 6146 high efficiency straight-through final. 100% plate modulation with push-pull modulator. High capacity double tuned circuits for maximum TVI suppression.

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### LETTINE RADIO MFG. CO.

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GET YOUR COMMERCIAL TICKET EASIER WITH... Kaufman's RADIO OPERATOR'S LICENSE Q AND A MANUAL now available 6th EDITION The BEST book for FCC License Preparation Covers elements 1 thru 8. The only book with complete discussion of answers to every technical question in the FCC Study Guide. Makes it very easy to answer multiple choice questions. Used by leading schools and industry. Only \$6.60 at jobbers, bookstores or direct from: JOHN F. RIDER PUBLISHER, INC. 116 West 14th Street, New York 11, N. Y. items are shown in the accompanying photograph. The groups at the left and right in this picture also include the standard-size counterparts of the new miniature items, for size comparison. The miniature bar-knob dial at the upper right, for example, is one inch in diameter as compared with  $1\frac{5}{8}$  inches for its larger brother; the binding-post assembly is  $1\frac{5}{16}$  inch over-all as compared with  $1\frac{1}{2}$  inches for the standard unit; the spacing between terminals in the terminal strips is  $\frac{3}{8}$  inch in the miniature units instead of  $\frac{1}{2}$  inch, and similar reductions in the sizes of other components.



A few of the other available small-size components are shown in the center group, including knobs and couplings. The assembly at top center is a dial with a round knob, pointer, and dial lock. The latter operates at an angle to the line of the shaft — a necessity for manipulation unless the hands that operate the miniature controls can be miniaturized, too! Dials and couplings are for ½ shafts. In general, the ultimate objective, now near realization, is to make available smaller versions of all the "hardware" of this nature in the Millen line.

# Strays "\$

We continue to get quite a number of reports of fellows having built the HBR-14 (described in July, 1957, QST). This is a photo of the one put together by K5DJU. He's quite happy with it.



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### Yasme II to Aves Island

(Continued from page 74)

tion of steel poles and plenty of guy wires but as one could stand here with a six foot pole, lean on it, and sink it right down into the guano without any undue effort it looked like a hopeless effort to bring our poles ashore and even attempt to guy them. I brought over my spinnaker pole, which is about 30 feet long, and we stuck that in the ground, as a shack-side antenna support, and hoped for the best.

A good ground presented problems. Our grounding rod was six feet long and by standing it on the ground it would almost sink and disappear under its own weight. Finally, as we were only a short distance from the beach, we got a length none of us checked, and with a ground which might, or might not, be good, the Onan was started up and we loaded up the HT-32. Within a few minutes of firing up we worked Dick, KV4AA, on 7245, followed by KP4WN, with good reports.

Later we swung over to 14 and 21 Mc. and found both bands fairly good. After one day, however, conditions worsened with some of the heaviest sunspot activity of this cycle and sometimes we wondered if the rig was actually work-

I tried to organize some sort of schedule for the lads so that each of us would have a fair go at the rig but weather conditions got so bad that I was forced to spend most of my time aboard Yasme taking care of her. We were anchored in 20 feet of water and for safety sake I had let out the entire 60 fathoms of anchor chain. To augment this I also put out another anchor with 3 inch rope but the coral soon cut through this rope and left us swinging to a single anchor. Several times I had the engine running to ease the strain on the anchor. On the Sunday evening, prior to our departure, the anchor chain snapped. Luckily, I was aboard at the time.

Our stay was now drawing to a close. Conditions had hardly been 100% but we had covered two week ends and I thought it high time to pull out in case the weather worsened and we were forced to leave the gear ashore. I told Dick that we would get QRT at midnight, Sunday (July 13) and load the gear on board at daybreak Monday morning. At around 9 P.M. Sunday we worked W4SRT, after which, the band packed up completely. Repeated CQs went unanswered and as we were all a little anxious about the weather. which seemed to be closing in fast, we decided to pull the big switch.

The HT-32 and SX-101 each took a separate trip out and we managed to get them aboard. Finally came the Onan which was another kettle of fish, being so heavy. It took all four of us to get that dinghy into deep water with Jules and Julio swimming alongside to keep it steady! Once in the clear, they managed to get it aboard. By this time the seas were building up again but, to make it brief, with a combination of

(Continued on page 200)

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split timing and lassoing, we got it on the Yasme's deck with only slight damage to the paintwork. We all breathed a little easier then and I was grateful for my decision not to take the HT-33 ashore earlier.

I then took the dinghy ashore for its last trip, to pick up Falke. As I came in to land a huge roller capsized the whole thing on the beach breaking an oar and the seat. Fortunately the outboard motor escaped damage except for a lifting clip which was snapped off. With Falke aboard, and with one oar, I was lucky to clear the beach and our last and final trip back to Yasme was completed without further bother. Once more we set sail. The day passed fitfully and gradually a very unwelcome night fell on us. At least we could not see the threatening clouds and it gave us a false sense of security.

First, out of the black sky, came the lightning. This was no ordinary flash. It struck the water no more than 100 yards from the boat. The discharge gave off an explosion which no half dozen jet bombers, breaking the sound barrier, could imitate. The pungent smell of the charge permeated the boat and I sat there, trembling with fear. How lucky we had been I shall never know. My whip antenna, sticking up over 80 feet from sea level and the long wire, strung between the two masts, were not grounded and, at that time, Jules was in QSO with KV4AA. I shot below and yelled to Jules to shut down the rig pronto . . . maybe next time, if there was a next time, we might not be so lucky. With a full drum of gas, lashed near the base of the mast, a direct hit of lightning could have been quite messy!

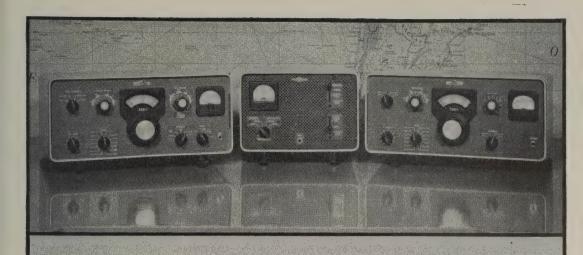
Directly after this a rain squall blotted out everything and it became as black as the insides of a whale. The squall died and for a few moments a deathly calm settled around us. The seas had gone mad, peaking up and falling all over themselves. Yasme bounced and fell in to the troughs, her two tiny sails useless. The heat became more oppressive and I sat there with Jules sweating with the anticipation of what would come.

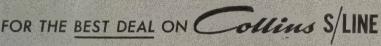
Then it came. First the wind gradually built up and with it the rain. No actual drops were discernible as it came down solid. The wind increased in fury and I scrambled onto the after deck to let the mizzen sail drop. I sent Jules below and had him close the hatch astern. He was too late. The wind had come around to the stern and solid water poured into the after cabin. Finally he got the hatch closed and I threw the auto-pilot out of gear and tried to get Yasme around to head into the wind. I didn't dare let her run before this hurricane wind with St. Croix, and its dangerous reefs, only a few miles off.

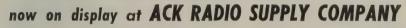
I had the depth indicator running and I tried hard to keep the boat clear of the shallows never bothering to even look at the compass. The indicator's tiny flash of light wandered around the dial sometimes reading 70 feet and at others only 30 feet.

As quickly as the wind had come, so it left us.

(Continued on page 202)







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The loom of lights from St. Croix blinked through the slight drizzle of rain and became clearer as the rain stopped. I put Yasme back on course and we both looked around for the lighthouse which, only a short time ago, was dead ahead. It had vanished and I suggested to Jules that it might have been put out of commission by the force of the wind. The lights ashore were no guide but the depth indicator showed depths varying from 20 to 40 feet and I knew we were in too close. The soundings on the chart gave me little help until Jules called down to me that he had sighted a white and GREEN flashing light, dead ahead.

I shot up into the cockpit and swung Yasme out to sea immediately. We were heading directly into a large fringe of reefs immediately in front of the air beacon light. Somehow we had been blown to the center part of St. Croix and had managed to avoid disaster only by using the depth finder. Checking the chart I found that present sounding tallied with the ones on the chart and that we had been blown 12 miles east of the lighthouse we had been aiming for originally!

I headed *Yasme* due south until we got "no bottom" on the depth recorder. Then, heading west for an hour we again picked up the lighthouse on the SW tip of St. Croix. Hauling up the mizzen sail again, to steady the boat in the rough seas, we slowly plugged around the point into Fredericksted roadstead.

It was then 3:30 A.M. Tuesday morning and I was pooped. I brewed up some coffee and Jules and I sat on the cockpit enjoying a well-earned rest. Julio and Falke had slept through the lot and were completely unaware of our previous troubles!

At 4 A.M., I managed to make rough repair to a broken jib sheet and we hauled up anchor, started the engine and departed on the last leg of our journey, 40 miles to St. Thomas. The 40-mile crossing was uneventful.

To sum up, we worked 2346 stations in 84 countries. All the equipment survived that trip as proved by subsequent activity at VP2VB and VP2KF and is still going strong. Seems as though the gear will outlast me the way I feel now!

### Strays \*\*

Last July the MIT radio club laid claim to being the oldest in the country. We have heard from K2LWQ, president of the Columbia University Amateur Radio Club (W2AEE), that he has documentary proof that the Columbia University club was in existence in 1908, and that there is some evidence that it may have been formed in 1906.

By the time you read this, Sweepstakes will have come and gone. As we write, we're still stringing antennas. Just remember to get those logs in the mail by December 3, 1958.

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### Pole to Pole on 40 Watts

(Continued from page 79)

Special mention must be given to K2KGJ, K2KGH, W2KCR, W2VH, K1NAP, K5JLQ, W6QPI, W1RST, and W8JYJ, who worked us every day and directed others onto our signal. We could go on — but it would mean copying the entire log book, contact after contact.

It is doubtful whether or not the uninitiated can ever realize the happiness that can be brought or the morale that can be raised by an ordinary hamgram. Only exiles like ourselves can appreciate what amateur radio offers. To watch the smile of happiness, or even a tear or two, on the rugged face of a Sea Bee when he has finished a contact back home, forces one to realize that there is something else in that shiny tin box besides a few tubes and a lot of wire. The operators on both ends of a contact become the confidants of the joys and sorrows, the fears and fallacies, the tears and trifles of loved ones separated for the moment. The operations of service men and scientists away from the States could never be as effectively accomplished without the aid of the hams back home. As is usual, these latter are the unsung heroes of the ionosphere. who report for work or school the next morning, sleepy-eyed and jittery, because they spent all night digging a 40-watt message out of the QRM. Many thanks and God bless them.

KC4USC will be heard again this coming winter; because of the generous assistance of several friends, the 40 watts has been replaced by a full gallon. I hope you work them.

# Strays

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# A Method for Scoring Hidden Transmitter Hunts

BY FRANK A. JEROME.\* KICOP

We have noticed in past issues of QST several articles describing direction-finding loops, but even though these activities are popular at hamfests and conventions, there doesn't seem to be much in print on how you score these hidden transmitter hunts. So we thought that some of the readers of QST might be interested in hearing how we do it up here in northern Maine.

There are several ways of running the hunt and whichever method you select is strictly a matter of personal preference of the group involved. The prerequisites to any plan are simplicity, good operating practices, and safety. We have settled on the minimum mileage and minimum transmission method of scoring. Each hunter is given one point for each mile that he drives to reach the hidden site. Another point is given to each hunter requesting a transmission from the hidden station. This method of scoring discourages numerous requests for bearing transmissions, and, because there is no time factor involved, it discourages speeding on the road by the hunters. (The first hunter to find the hidden transmitter is not necessarily the winner, you

One of our "must" rules is that there be no trespassing on private property. By sticking with public property (backwoods roads, parks, and the like) we keep out of trouble with property owners. Another one of our rules is that the hidden station must make each of his transmissions the same length. We have decided on a 30-second transmission as the standard — this could be shortened or lengthened depending on your proficiency at taking bearings.

Now for an example of how we do it. It's a nice sunny Sunday afternoon and all stations meet at some prearranged assembly point. The hidden station has to meet here too, because he is the official scorekeeper and must record all odometer readings at the starting line. Once this is accomplished he takes off for the hidden site that he has selected. The gang ragchews on the frequency until the hidden station comes back on the air and announces that he is indeed hidden. While he is announcing this and asking other non-hunters to keep the frequency clear, the first sets of bearings are being taken and the hunters are off. There is no speeding, and no chatter on the frequency. Eventually, however, someone has to ask for a bearing transmission. He pays a point for the service, but lessens the possibility of cov-

(Continued on page 208)

<sup>\*</sup> Box 291, Washburn, Maine,

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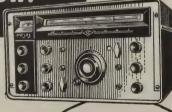
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ering too much distance. Of course, each of the hunters benefits from the transmission, and this is where cunning and eleverness pay off. The hunter must constantly balance his need for a bearing transmission, the point penalty for same, the possibility of excess mileage, and the probability that someone else will soon call for a bearing.

If you ever come up to this neck of the woods some Sunday in the summer and you see a mobile station complete with loop antenna going slowly down the road in reverse gear, you'll know that he has asked for a few too many transmissions and now must concentrate on saving his mileage!

# Strays "

In the photo below Howard Seefred, W6EA, and Don Wallace, W6AM, are admiring the ARRL Historical Exhibit at the annual West Coast IRE show (better known as WESCON). An extensive display of equipment, some of which was supplied by ARRL headquarters, was assembled by Al Hill, WoJQB, vice chairman of the historical exhibit and ARRL Section Communications Manager of the Los Angeles Section. Among the equipment on display was a Kolster decremeter used for checking spark transmitters in pre-World War I days, the original 1920 KNX and KFI transmitters, the 1926 Rectobulbs used in the 6-phase W6AM rectifier, some Clapp-Eastham equipment of 1913, some Dubilier of 1920, and a whole raft of equipment loaned by W6GH and by W6EA, among others. Incidentally, W6EA and W6AM first worked each other on the air in 1911 using code and in 1913 using phone. There is some indication that W6AM, in particular, is still active.





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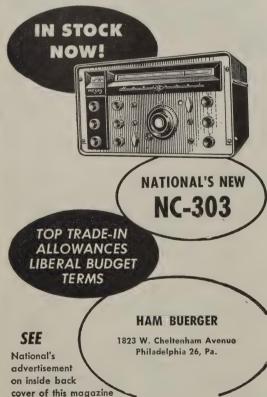
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Field Day in Motion

BY MARK E. BALLARD,\* W9BSZ

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(Continued on page 212)

\*721 West Seventh St., Marion, Ind.

Here are the operators who went on the 250-mile jaunt for a Field Day in Motion. Left to right are W9BSZ, W9CVO and W9ZTZ.





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changed our field day operation into a roadway day excursion.

Here in Indiana we have a network of base and mobile stations using commercial type n.b.f.m. equipment on 147.3 Mc. Nearly every county has at least one base station and a number of mobiles in addition to which the Indiana State Police posts are also equipped to carry on two-way communication as long as an amateur radio operator is on duty at the police post. These units are a fundamental part of our Civil Defense communications system.

On this roadway trip we used an n.b.f.m. unit on 147.3 Mc. in addition to a Gonset Communicator III for our mobile station. During our 250-mile highball we made seventeen contacts. This trip took only seven hours. We felt our results

(Continued on page 214)



The Kokomo gang was too busy making contacts to turn around for a mug shot. They piled up an impressive score on Field Day.

The Cass County group had their setup in a corncrib. Operators shown are K9GMH, K9AWH and K9HFC.



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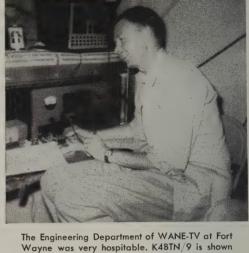


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Wayne was very hospitable. K4BTN/9 is shown operating from a small tent in the middle of a mosquito field.

At Peru, we got three members of the Miami County Club together for a snapshot: K9ACR (prexy), K9IOO and K9GPQ.



on 6 meters and a fixed-frequency transmitter and receiver on 147.3 Mc. Now that we have gotten our feet wet with this kind of operation we are making plans for a more elaborate roadway operation next year.

# were quite good considering we were using a whip SINGLE MOBILIER

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#### V.H.F. and U.H.F. Reception

(Continued from page 31)

result for a perfect receiver or 0-db. noise figure. Note how a small reduction in noise figure is increasingly important at the higher frequencies.

Fig. 3, it should be pointed out, is based on average cosmic noise (Fig. 1), and therefore does not represent the best conditions, Also, there are certain other limiting effects that must be considered in a practical case and which cause the two lower curves of Fig. 3 to level off rather than to continue downward as does the cosmic noise curve.

First is line loss; you simply can't afford to have very much. Anything that dissipates power also contributes thermal noise. This leads us to consider the use of pole-top front ends or, at u.h.f., waveguides. Also, we must take into account the effects of atmospheric absorption its attenuation contributes some thermal noise. For the conditions assumed in Fig. 3, it becomes severe only above about 1000 Mc. Solar noise can be overwhelming when we are dealing with low levels and we must avoid the sun with our antenna beam. Hotspots of cosmic noise (radio stars) should also be avoided. Ohmic losses in the antenna must also be minimized due to their resistive noise.

Perhaps the most serious of all is the effect of the ground in front of the antenna. If it is a perfect reflector, there is no problem as it can contribute no noise. However, there is always some loss from ground reflection. This loss looks like a room temperature attenuator and contributes noise. (It is of interest to note that horizontal polarization gives considerably less ground noise contribution than vertical.) The best way to beat it would be to simply have a perfect ground, such as a copper sheet two miles across! If this is not feasible, the next best thing is to tilt the beam up away from the earth; fine for lunar and highangle meteor work. However, for tropospheric scatter, you will take a beating in doing this because of the increased scatter angle. Even with the antenna tilted up so as to avoid the ground in the main lobe, we still expect some additional noise from side and back lobes which illuminate the "noisy" earth.

Fig. 3 was computed on the basis of representative values of these factors that might be

experienced in a typical case.

It is also of interest to consider the best possible situation. This corresponds to viewing the coldest portion of the sky and operating with the antenna tilted up from the ground to eliminate the main-lobe ground contribution and the majority of the atmospheric loss. The over-all effective noise figure under these conditions is shown in Fig. 4 for a zero db. noise figure receiver. It can be seen to represent improvement over present equipment of 3 db. at 144 Mc., 6 db. at 220 Mc., 12 db. at 430 Mc., and 15 db. at 1300 Mc. At 144 Mc., this improvement may be just enough to put us in business with regular moon-bounce contacts. It also corresponds to (Continued on page 218)

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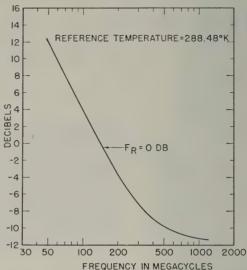


Fig. 4—Over-all effective noise figure for an antenna pointing at a "cold" region well above the horizon.

At the higher bands, the improvement is considerable. The table below takes this improvement and translates it into what may be expected on tropospheric scatter, meteor rate, and lunar echoes, for the power and antennas indicated. It is assumed that c.w. is used with narrow-band receiving techniques.

220 Mc. 432 Mc. 1300 Mc. Antenna 150 w.  $150 \text{ w.}^2$ Power 150 w. Antenna Gain 24 db. 23 db. 27.5 db.  $(24' \text{ dish}) (17' \text{ dish}) (9\frac{1}{2}' \text{ dish})$ over Dipole Tropospheric <sup>3</sup> Scatter Range 425 mi. 440 mi. 365 mi Meteor Rate 1.8/min. 0.9/min. 0.13/min. Moon Echo, add'l. system improvement

1.5 db.

0 db.

7 db. required For power outputs of 150 watts and modest size antennas, we find that consistent tropo-scatter ranges of nearly 400 miles are to be expected on all three bands. Meteor rates, although dropping rapidly, still indicate about one burst every 7-8 minutes at 1300 Mc. Moon echo work may just be feasible at 1300 Mc. as the calculations indicate it is on the ragged edge. Increases in power and antenna size beyond the values indicated should make these higher frequency bands even more attractive. It is evident that with the very low noise figures which are now within reach in amateur practice, performance may be expected on the higher bands that equals or exceeds that on 2 meters.

<sup>&</sup>lt;sup>2</sup> Of academic interest only due to the present 50-watt limitation.

<sup>&</sup>lt;sup>3</sup> For tropo we are forced to beam toward the horizon and hence accept some degradation due to ground noise in the main-lobe and atmospheric loss. This is significant only on 1300 Mc., however.

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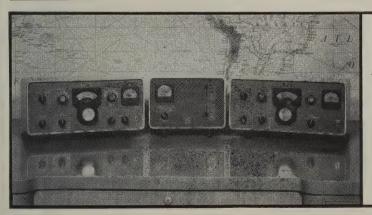
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#### What Is A DXer?

BY PAUL AMIS,\*1 W7RGL

Between the innocence of a Novice and the dignity of the Traffic Man we find a harassed creature called the DXer. DXers come in assorted sizes, modes, and powers, but all DXers have the same creed: to work DX every second of every minute of every hour of every available day and to protest with higher power (their major weapon) when the band starts to fold and ionospheric punishment finally shoos them up to 75 meters.

DXers are found everywhere—on top of, underneath, barely inside of, sliding into, drifting out of, or switching to.

Beam manufacturers love them, rag-chewers hate them, DX tolerates them, traffic men ignore them, and heaven protects them.

A DXer is skill with a chirp, concentration with a cigarette glued to his lip, superstition with a text book, and a fount of technical know-how with a touch of TVI.

When you are rag-chewing, a DXer is an inconsiderate, bothersome, intruding jangle of QRM. When you succumb to working the "buddy system" with him, his brain turns to jelly, or else he gets his finger stuck in the bug. When you've given up in disgust and tuned elsewhere, he'll operate like a demon, tail-end like a pro, and come up with seven new ones in exactly 27 minutes flat.

A DXer is a composite — he has the memory of a UNIVAC, the shyness of a pile-driver, the strategy of Halsey, the energy of an atomic bomb, the stealth of a cat, the lungs of a dictator, the audacity of a steel trap, the enthusiasm of a fire-cracker, and hasn't been to a motion picture in years.

He likes 20 meters, coffee, hilltops, winter, beams, big tetrodes, ten-acre farms, the mailman, swivel chairs, QST, women (occasionally), Saturday mornings, maps, band-edges, pilot lights, and sunspots. He's not much for ragchewing, dipoles, kids in the shack, s.w.l.'s, low-level modulation, apartment houses, OOs, channel two, Field Day, novices, or traffic.

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(Continued on page 222)

<sup>\*</sup>Rt. 1, Box 438, Poulsbo, Wash.

<sup>1</sup> With apologies to Alan Beck and "What is a Boy?"

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#### Strays



At the 10th ARRL National Convention in Washington, August 15–17, several amateurs were cited for their assistance to the military. Here the Air Force's choices receive presentation microphones from Gen. Curtis LeMay, Vice-Chief of Staff, USAF (and K4RFA!). Left to right, K4KCV, K4RFA, W9NZZ and W3IYX.

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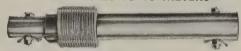


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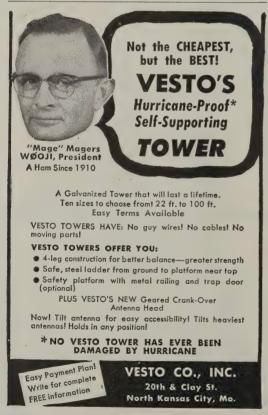
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W1, K1—G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.

W2, K2 — North Jersey DX Association, Box 55, Arlington, New Jersey.

W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.

W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.

W5, K5 — Robert Stark, W5OLG, P.O. Box 261, Grapevine, Texas.

W6, K6 — Horace R. Greer, W6TI, 414 Fairmount Avenue, Oakland, Calif.

W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.

W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.

W9, K9 — J. F. Oberg, W9DSO, 2601 Gordon Drive, Floss-moor, Ill.

Wø, Kø—Alva A. Smith, WøDMA, 238 East Main St., Caledonia, Minn.

VEI — L. F. Fader, VE1FQ, 125 Henry St., Halifax, N. S. VE2 — George C. Goode, VE2YA, 188 Lakeview Ave., Pointe Claire, Montreal 33, Que.

VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.

VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man. VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 833 10th St., North Lethbridge, Atla.

VE7—H. R. Hough, VE7HR, 1684 Freeman Rd., Victoria, B. C.

VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T. VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newf. VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay,

Labrador. KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R. KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.

KL7 — KL7CP, 310-10th Ave., Anchorage, Alaska. KZ5 — Catherine How, KZ5KA, Box 407, Balboa, C. Z.



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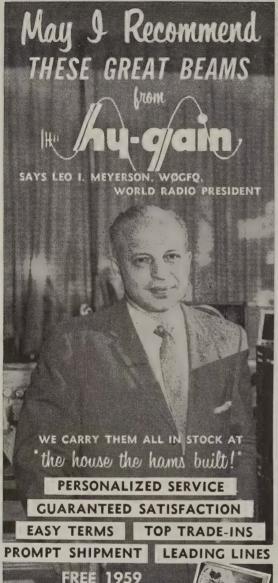
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Boom Length: 104"
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Q-12

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BARGAINS: Send for list of reconditioned receivers and transmitters with new guarantee. 10% down with up to 24 months to pay. In stock, new Collins, Johnson, Hallicrafters, WRL, National, Hamarlund, Gonset, Elmac, Drake, Central Electronics, B&W, Hy-Gain, Mosley and Gotham beams. Shipped on approval. Write Ken, WØZCN, or Glen, WØZKD, for your best deal. Ken-Els Radio Supply Co., 428 Central Ave., Ft. Dodge, Iowa.

DX Radio Coop forwards outgoing OSLS, 2¢ each. Callbook, \$5.00, schematics, 50¢, Sam's Information free with schematic, 500 QSO File Cards, \$4.00. Free Flyer. "DX Radio Coop", Box 5938, Kansas City 11, Mo.

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DUMONT scope model 241, \$70; Gonset 3-30 shortwave converter, \$20; Precision E-200 signal generator, \$20; RBM-4 Navy receiver 200 Ke-2 Mc., \$40, Heath VFO \$16. W3IHD, 4905 Roanne Drive, Washington 21, D. C.

PARTNERS, retired hams, electronics investment. R & D Co., W3IVZ.

W3IVZ.

ANTENNA 80-40-20-15-10, \$21.95. Patented. Lattin, W4JRW, Box 44, Owensboro, Ky.

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pleate mounting, \$2.00. L & J Products Co., P.O. Box 122, Downers Grove, Ill.

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WANT, Want; Collins 51J1 or 51J2. Must be in gud shape, N. K. Thompson, WILWV, 99 Water, Millinocket, Me.

Thompson, volunto and boats. Will take ham gear in trade. Write: Boyd Reter, KøIMO, Boyd's Marine Shop, Clinton, Iowa. SELL: Model 15 teletype with AC motor and table perfect condition, \$175. WØFMK.

WANTED: Aircraft, Airline, Military Electronics gear and test equipment, Collins, Bendix ARC, Airforce, Narco, BC348, ARN6, ARN14, ART13, 51R3, 1884, 51V2, Many others, We pay C.O.D. Advise price, condition. Ritco, Box 156, Annandale, Va. Phone JEfferson 2-5805.

WANTED Urgently: Used "Ranger" and Hallicrafters "S53A".
Must be in gud condx. KN8LQK, 7790 Alameda, Youngstown, OhioCOLLINS 32V3 for sale. Best offer. Clean, excellent condition,
W. E. Waldrup, 220 South Lincoln, Burbank, Calif.

TRADE 1956 black, 4-door customline Ford, overdrive, 20,000 miles, for single sideband equipment. K5ISN, 200 Bafanwood Drive,

miles, for single sideba Hot Springs, Arkansas

Hot Springs, Arkansas.

7G-34-A. ode keyer and amplifier with case, tape 115V to 220V, \$18; Hallicrafters SX-99 rcvr, \$95; Heath "Q" multiplier wired, \$8; Heath AM-2 reflected power meter wired, \$15; Heath voltage calibrator, \$5; B&W balun coll, 40M 1000W, \$5; 12V dynamotor DM 40-A, \$1; BC348 rcvr, less power supp., \$15; rcvr 65ZA 2.0-6.0 Me., \$15; Johnson Viking Vallant factory-wired, \$390; Johnson GN2 factory-wired, \$100; Tecraft 2-M converter, \$35; 6-M converter, \$35; transmitter 653-A with dynamotor, \$20. Most equipment with books. Will ship express collect. K4MQR, Ed Basham, Box 203, Muldraugh, Ky.

SELL: DX-35, VF-1, excellent condition, \$65. Stan Weiman, K9HLE, 1511 Brummel, Evanston, Ill. GR 5-7806.

Oops! Left out of my November ad! 500 mill filter choke, \$6.00. D. B. Mitchell, R. 1, Box 59, Whinebago, Ill.

HEATH VF-1, power supply, \$20, or best offer. K4MQZ, Box 413, Black Mountain, N. C. ONE DX-100 that will get DX, \$175; 2 Navy type two-way transceivers with batteries, ant, phones and keys, in wkg, order, plus 21 Novice band PR xtals, \$1.00 each. KØHWK, Guy Hall, Alburnett,

Towa WANTED: National AR-16, center-link grid coils for all amateur bands. Willing to pay well for complete set or for individual coils, Also, factory-wired Ranger in excellent condx; in vicinity of Albany, J. E. Whiteraft, 63 South Main Ave., Albany 8, N. Y.

IMMACULATE NC-300, whole station, and tons of parts. Write for list of good deals. Joe Morgan, K9HBS.

for list or good deals. Joe Morgan, Kyrlds.

SELL Or trade: 75A2 and Viking II with push-to-talk. Includes matching speaker, crystal calibrator, coax relay, coax switch, Viking VFO, low pass filter, Vibroplex Presentation model w/oase, Bud oscillator, monitor, Jones MicroMatch, 2400 hour clock, speech clipper, D-104 mike, 60 ft. Khuene tower, Tellerx 10-m. beam, Kreeo 10-meter coax, C-D rotor, 200 ft. RG8U. Complete, \$550. Also I KW phone rig using 70 to 100 watt driver with spares, \$300; BC-221-J and A.C. supply, \$50; SK-600 socket, \$7; Jennings VVC-25, \$6; new JFD 50 ft. push-up mast and base, \$14; new Elmac 4CX-300, \$30; new Elmac 4X-2508, \$25; SW-54, \$25; D.C. meters, 0-5 KV. 0-2KV, 0-500 Ma., 0-800 Ma. 0-1 amp, 0-300 Superior 230/115,volt 9 amp powerstat, \$25. Will sell all of above or trade toward cabin crulser. WIGOL, 5 Summit Ter., Peabody, Mass.

FOR Sale: Complete station, less antenna: DX-100, S-85 receiver, Matchbox, Turner mike and key #250. Also have FCC-100 Kc marker, \$10. Offers? W9ETM, 412 Woodson &c, LaPotre, Ind.

RICH At W8JS is looking for a Bacon banjo, tenor style, any condition, buy or trade ham equipment. Richelieu, 3425 Middleton, Cincinnati 20, Ohio.

Complete Station for sale: Collins A4, \$450; Pacemaker, \$350 and Thunderbolt amplifier kit, \$425. This kit is all assembled but never put on air. Combined sale price, \$1225. Cash only. No trades. Call Gloversville, N. Y. 5-4677. K2EJD. FOR Sale: Heathkit MM-1 VOM, book, leads, DeForests 2 in. 'scope, \$25. Dave Thomson, 3213 Osborne, Racine, Wis.

VIKING KW, operating desk, right side, \$1295. Curle Radio Supply, 439 Broad St., Chattanooga, Tenn.

SALE: Prop Pitch motor converted transformer, selsyns, dial, excellent, cheap. Storch, 5 Winfield Terrace, Great Neck, L. I., N. Y. SSB For sale, unmodified, like new condx, KWSI and 75A4, both for \$1728. Also unmodified 32VI and NCI83 with tilt-stand, Select-O-ject and MB-3 Boomerang for \$466; both combinations together, \$2150. Cash only, you to pay shipping. Beler, 714 Pluma Drive, Bellevue, Nebraska, Phone Omaha BE-3012. All queries answered. Bellevue, Nebraska. Phone Omaha BE-3012. All queries answered. CLEANING House! Unused JAN tubes: 813, \$8; 815, \$7; 829, \$5; 832, \$5; four 807s, \$3. Many tubes 1930 vintage, all test OK; write for list. Knight transistor checker, \$5; Heath radiation counter, perfect, no batteries, \$25; Heath WA-P2 preamp and W-5M Williamson power amp., perfect, both \$40. 4 x 5 Speed Graphic, many extras, one owner swap mobile gear or deal. W2DJJ, R. Hertzberg, 241-16 Alameda Aye., Douglaston 62, L. I., N. Y, Tel. BA 5-5384.

SELL HT-30, Heath grid-dipper, Simpson volt ohmmeter, and other effects of late W3JCG. Si Richie, W3QC, 6402 Osborn Road, Hyatts-ville, Md.

SELL: Viking I, Viking VFO; 75-watt xtal c.w. xmttr. Best offers. Want 10B or similar SSB. Wolf, 128 Willow St., Brooklyn 1, N. Y.

WANTED: A 125 watt polymatch modulation xfrmr and a 2.1 ratio split secondary interstage xfrmr. Will trade a Collins 75A-3 xtal calibrator for above. Smitty, K4DXI, Box 724, Greensboro, N. C.

XYL Housecleaning: Sonar MB26 xmttr; SR-9 revr, also pwr supp.
LeHine 240 (all coils), NC183D revr (Supreme 5" scope, #552 HF
10-20 conv. VFX680 FM RCP (extra), sig. gen. #702 Alliance rotator, Cardax E-V mike w/stand, Harrison map of world, indicator for rotator; transmitting tubes and components. Make offer. Mrs. Judith Jacobs, K2KBQ.

WANTED: Factory-wired Central 20A or similar, linear. State condition, accessories and eash price. David Bell, 940 Northill Rd., Baltimore 18, Md.

FOR SALE: I Kilowatt xmitter selling in sections. State your needs. Final has push-pull 4-250-A plus 500 watts, Class B, with 810s, companion power supplies, Variac, cabinets, etc. John Savonis, W1DBS, 11 Dwight Court, New Britain, Conn.

COMMUNICATIONS Engineer: Key position with nationally known firm in a modern, well-equipped facility. To assist in development of expanding line of communication and navigation equipment, Experience in design, layout and prototype fabrication essential. Send resume to Mr. J. C. Aldige, Applied Electronics Company, Inc., 213 East Grand Ave., South San Francisco, Calif.

SELL: New tubes, pair 4X250Bs, \$20 each; pair 813s, \$7 each; pair 4-65As, \$8 each; pair 6146s, \$3 each. W7AVS, 5318 E. 28th St.,

Tucson, Arizona.

FANTASTIC — Novices, experienced hams, complete amateur station; SX-24, Q'Xer Globe Scout 65A, Heath VFO, xtals, key, mike; 2-30 Mc. balun and special; 2.5 KC at 400 Ma, pwr supply for that KW dream rig of the future. Need money bad. What say? \$225 takes all. Bill, K2ZRK, Peapack, New Jersey.

SZZZZ TARES AII., BIII, KZZKK, FEBDACK, New Jersey.

GUARANTEED DX! Wonderful QTH with installed, and Los Angeles approved 80 ft. steel tower, \$18,900. Price includes lovely 3 bedroom, den, 2 bathroom home, 200 amp. service, 50 amps in den, large patio, drapes, carpeting, many ham extras. Picture and details upon request. W6AJJ, 15448 State St., Sepulveda, California. Phone: EMpire 2-5117.

SELL: Pair BC-611 walkie-talkies. The chassis, mikerphones, ear-phones, and batteries are new, 3885Kc., complete: \$100. T. Joseph Shank, Jr., 2310 Washington Blvd., Huntington, W. Va., W8KBT.

Snank, Jr., 23:10 Washington Bivd., Huntington, W. Va., WSKBT. WANTED: S.(455-J-08) and 2.1 (455-J-21) Collins mechanical filters for 75-A-4. Also vacuum variable 10–300  $\mu\mu$ fd. K2HWP, 100 No. Davis 8t., East Syracuse, N. Y. COLLINS 75A-1 with "B" slicer, factory-checked, \$235; Central 20-A with QT-1 and with Deluxe 458 VFO, \$215. Cleanest equipment in U. S. A. Will ship. Morgan, KØETG, #19 Briarcilit, 8t. Louis, Mo. FOR Sale: Eldico SSB-100 one owner, \$300, Gonset G-66 with Universal power supply and connecting cable \$150. S. J. Butry, W6WMY, 7 Paso Cresta, Carmel Valley, Calif.

NOVICES: Good 350 voit 125 Ma. power and filament supply, including 807 tube and socket, 6V6 tube and socket, all for \$10; Gardiner code sender with 18 rolls V.G., \$19; Vibroplex Lightning Bug, new, \$14. W8WTK, John Bittens, 6463 Buckingham Dr., Parma, Ohio.

Falina, Onio.

SELL: Hallicrafters S.P. 44 Panadapter, \$35; Sylvan 2 meter converter, 14 to 18 Mc., \$15; Tecraft 2 meter converter, 14 to 18 Mc., \$15; Electro-Voice speech clipper, new, \$20; Millen S.W.R. bridge, \$5, W2CZE, RD #1, Box 74C, Newton, N. J.

DX-100 for sale. Best offer over \$150 takes it. Like new condx. Wiring checked by professional engineer. All letters answered but self-addressed envelope appreciated. W2HBV, 654 Freeman St., Orange, N. J.

SSB Station for sale, HT-32, NC-300, plus all accessories. K2RSP, Frank Smith, 3180 36th St., L. I. C., 6, N. Y. Phone AS 4-7154.

CANADIANS! 75A4, one year old, factory-checked, in new condx, speaker and 6 Kc. filter. Price: \$675. VE3BVV, Brantford, RR #4, Ont., Can.

HAM TV Camera, Complete (tubes, power, Ike, etc.). Works FB! Homebrew. Will be willing to ship. Live telecasting, \$165. LSJ freqmeter w/book, less xtal and cast. Modulated, 20–28 Mc., \$35. Mark Goodman, W6AKG, 152 Alta Mesa Rd., Woodside, Calif.

WANTED: Power supply for BC-779-A. Quote price. Ken Goodwin, USCG Air Det., Navy 103, FPO, New York, N. Y.

\$200 buys immaculate factory-wired push-to-talk Ranger. Will ship freight collect in original factory carton. K4KWO, Anderson, S. C.

WANTED: Globe Chief 90A and SX-101 Mark III. State price and condx. G. S. Seyfiert, 31 South Mercer, New Castle, Penna.

HAM TV Equipment. Bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

FOR Sale: Hallic. S-76, used but in exc. condx, \$95; Mosley 3-element 20-m Vest pocket, \$30. Belden Morgan, W1FEA, Kinne Road, Glastonbury, Conn.

SELL: NC-98 with matching speaker, gud condx, \$100; AC-1 ant. coupler, \$7. Dennis Williams, 1656 Buena Vista, Decatur, Ill.

FOR Sale: Johnson Vallant, factory-wired; in excellent slrape: \$325. Test It at K2GS. Herbert Berner, M.D., 1033 East 9th St., Brooklyn 30, N. Y. Fel. Espianade 7-1850.

30, N. 1. Feb. Esphinate (\* 1802). \$40 revr in gud playing condx, \$50; Vibroplex in like new condx, \$9.95. Send for list. Blum, 396 E. Whittier St., Columbus 6, Ohio.

\$9.95. Send for list. Blum, 396 E. Whittier St., Columbus 6, Ohio. XYL Says, clean out the shack! Have some power supplies with 2-836s, plus chokes, condensers and many other good parts; a couple of 28V dynamotors 375V at 150 mils; Vaitran 30-110V output 11 amp, and a bunch of other good items, cheap. Send for list. Milt Berman, W4URG, 1809 Hartman, Louisville, Ky. SELL: Complete SSB station, NC173 receiver, Model B slicer, BC458 VFO, Central Electronics, 10-B, Gonset 400 watt linear—everything immaculate, worked DXCC, \$550. Leon Little, W8NXU, Linden, Ind.

TV Camera wanted. Surplus ATJ type CR-59AAG preferred. W8RMH, 1910 Long Point, Pontiac, Mich.

WSRMH, 1910 Long Point, Pontiac, Mich.
FOR Sale: DX100, Apache type ant. loading and keying, with spotting P.B. New 6146 tubes, Lynnar T.R. sw., \$199. Gene Reynolds, WSEAN, 53 Marple Road, Haverford, Penna.
SELL 75A-3, serial #701. 800 and 3000 cycle filters. Crystal calibrator. Gear reduction tuning knob. Mint condition, never raced. \$375 FOB Hartford. W11KE % ARRL.
MUST Sell for school: Factory-wired Viking Ranger, \$210: HQ-140X, \$225. Both for \$400. Both used less than 100 hours. Please write: W5KKH, 719 Carolyn, Austin, Texas.

FOR Sale: Presently operating complete SSB, AM CW station, Factory-wired Viking II and VFC: B&W 51SB, SSB generator; HQ-140XA and matching speaker, \$550 takes all. W2TSR, Burnbach, 80-67 222 St., Queens Village 27, L. I., N. Y.

FOR Sale: Chicago area. Come and get it! All equipment in like new condx: SX101 Mark III, \$300; Drake revr. \$225; HT-32, \$400; JAP SX99, \$75; HT-31 lineur, \$300; 1 Kw linear, March 1958 QST, complete with rack and all supplies, \$600, 2500V, 7A power supply, \$75. Bill, Fillmore 5-2215. Westchester, III, Frankart, 1259 Boeger

SELL Collins 32V1, perfect, spare 4D32, \$265. Don Peraro, KØCEQ, 3328 So. Glencoe, Denver 22, Colorado.
20A, VFO, QT-1, \$215; need 4X150A sockets. W2MHL, 147 Fairview Ave., Paramus, N. J. Tel CO 1-9449.

VIEW AVE., Paramus, N. J. 1et CO 1-9449.
FOR Sale: Globe King 500A, bought reconditioned from WRL in January, \$450; SX-96 in gud shape, \$150. D-104 and stand, Johnson low-pass filter free IF xmitter and revr sold together. Will ship, C. Fry, 3621 Melody Lane, Odessa, Texas.
WRL Globe Chief 90 xmitter, in gud condx, will sell for \$45 or trade for ??? I am willing to ship, John Burnett, K9JFZ, 224 Northwestern Ave., Lafayette, Ind.

FOR Sale: NC-109, used only a few hours. In practically perfect condx: \$125. Bob Jehu, KNIGLL, 15 Lois St., Danbury, Conn.

POLICE cruiser, never used by city, completely equipped with ham gear, 30,000 miles in perfect condx: Elmac Af67, Gonset G66-B 12 volt heavy duty alternator, police-interceptor engine. Will sell whole car or radio gear separately. All inquiries answered. Best bargain since spark-gap days. Call or write to Mike, K2GMV, 119 E, 38th St., N. Y., MU 9-7662.

SELL Ortrade Gonset Mobile Twins, complete with mike and Rafred all-band antenna. One year old, in exc. condx. N. K. Thompson, WILWV, 99 Water St., Millinocket, Me.

SELL ATJATK T.V. camera with power supply and coupler to TV set. 30 feet coax. Companion 35 wart transmitter AXT-2 schema ics and instructions, \$225. Babcock 3 channel radio control transmitter BCT-4 receiver BCR-4A two servos 6 ft. Piper Cub with two-speed engine. \$120. Frank Webster, W6CIF, 4721 Willowbrook Ave., L. A. 29, Calif.

FOR Sale: SX-101 Mark III and speaker, plus ohms meter, all less than four months old. No offer refused over \$300 on first come first served basis, J. Silver, 155-11 89th St., Howard Beach 14, N. Y. WANTED: The following coils for National's 1933 SW-3 (DC) receiver; #10, #11, #12, #16, #17, #11A and #13A. Sets of two. Very anxious to buy these! Hasbrouck, 1157 Palms Boulevard, Venice, Calif.

WANTED; for K.W. rig: MultiMatch modulation transformer, plate transformer, one 333A, pair 810s, coax relay, low pass filter. Locals phone gain. K2JDW, 62 Gaston St., West Orange, N. J. LAKESHORE Industries Bandhopper VFO, 875; homebuilt CW xmittr w/807 final and power supply, \$25. R. Houghton, WINKE, 48 Foster St., Littleton, Mass.

SELL Collins 75A4 receiver. Mint condition, no scratches. 3.1 Kc filter and Collins speaker. Ship anywhere collect, in factory carton. First check for \$500. Ed Cerles, W@GFJ, 1035 Westglen Drive, Webster Groves 19, Mo.

SELL 25 to 42 Mc. mobile transmitters, complete with tubes and dynamotor, \$7.00 each. Receivers for same frequency, \$27.50 each; 1–208 FM signal generator 19 to 45 Mc., \$45. Ralph Villers, Box One, Steubenville, Ohlo.

75A2 — Late model with 3 Kc and 800CY. Mechanical filter kit installed, good appearance and condition, \$295. F.o.b. Atlanta, Ga. W. E. Coogler, Jr., W4DOC, 286 Howard St., S.E.

FOR Sale: \$100. Hallicrafters SX28. Needs some work; Hallicrafters S102, new; SCR522 partially converted, Telrex 2M5C, prefer local deal. Contact E. M. Estok, 178 Westminster Place, Lodi, N. J.

SELL: Harvey-Wells TBS-50D, 6VDPS and 110V APS power supplies; Gonset 3-30 converter; Johnson SWR bridge, with meter; Bud GK-79, G1MIX, Telrex model 1030s, 10M beam; Hy-Gain 80AV all-band vertical; Gonset clipper; Hallicrafters S-38 receiver; new 40 ft. telescopie steel mast; Advance antenna relay, Any reasonable offers accepted. W3SIW, 223 Hillock Lane, Pittsburgh 36,

FOR Sale: Communicator III in gud condx, \$200. K. C. Glaser, 2502 Dwenger, Ft. Wayne, Ind.

SALE: Gonset Communicator II, 2-meters, 12 volts, excellent condx, \$145. Keller, 514 Stevens Rd., Morrisville, Pa.

SELL: HQ-129X, 100 Kc. calibrator, speaker, \$130; Panoramic Radio model PR-1 Panadarter, \$115; W3DZZ Tri-band beam, \$120. D. A. Contini, W4YUU, 2086 Thomasville Rd., Tallahassee, Fla. SALE: Collins KW-1. R. Van Wuyckhuyse, W2CR, 412 Humboldt St., Rochester 10, N. Y.

WILL pay \$40 for S-20R. Walter Tukkanen, 17th Cml Det. Army Chemical Center, Md.

JOHNSON Adventurer, like new, in perf. condx: \$40. Michael Nisenbaum, K2VTY, 1585 E. 172nd St., Bronx 72, N. Y. TI 2-7498. HAMMARLUND HQ150, in mint condx, matching speaker, \$230. Will be glad to deliver 100 mile radius of Chicago. Bill King, 204 Lagoon Drive, Northfield, Ill.

Escuti Brite, Northheat, In. SELL: Best offer over \$600; 75A-4, spkr, 3 Kc filter, Ser. No. 4553; Pacemaker, \$450, Ser. No. 16888 or best offer; 40 ft. steel tower, \$40; 2-el. 20 meter Hy-Lite, \$20; D-104, \$10; Johnson T-R switch, \$18; Johnson SWR coupler and indicator, \$28; 6V DC inp. 300V DC at 200 Ma. outp. Vibropack \$10; Vibroplex Blue Racer, \$8; Original, \$10. Must sell fast. J. Bennett, W8QYS, 7107 Orchard Ave., Parma 29, Ohlo.

29, Ohio.

SELL: Johnson KW with desk; new Pacemaker, Ranger, Johnson Audio Amplifier, power reducer for DeLuxe AM-SSB-CW-KW station. A-1 condition, Priced low! 3 five-element Teirex Beams! 10. 15, and 20 meters! Complete track, carriage, winch, and accessories for Deluxe antenna mounting. Full details available! Sell as complete station or individual units. F. W. Cooper, 66 Seminole Way, Short Hills, New Jersey.

FOR Sale: Homebrew xmittr 829-B final, all bands 20-80 meters VFO 120W. C.W. and AM. 1V40 Gotham vertical for \$14.00 and shipping. Xmitr. \$150 and shipping. Herman La Pierre, K2MMI, West Chazy, N. Y.

SELL: HT-33, \$600; Communicator III, 2 meters, \$220; SP-44 Panadaptor, \$45; BC-221B and A.C. power supply, \$65; WRL-speech booster, new, \$17: Tri-Ex 38 ft. tower, Roto-Brake and rotator, \$150; 2M-15 el. beam, \$23; Millen SWR meter, \$10: 6V mobile power supply, \$25; Tecraft 2M converter, \$25; 2M Kreco Ground plane; Mosley 15 and 20 Minibeams, \$50; pair of field phones, \$30: 2M linear amp. (L&W), 14 Mc, Input, \$50, Lamb, W3VDE, 1219 Yardley Rd., Morrisville, Pa.

SIX Meter station, used less than 20 hours: HQ-100 revy, Tapetone

Yardley Rd., Morrisville, Pa.

SIX Meter station, used less than 20 hours: HQ-100 rcvr, Tapetone XC-50 converter with VR power supply, LW-50 transmitter with power supply, Telrex 3-el. beam, Alliance T-12 rotator, Heathkit grid dip meter, EMC Model 104 multimeter, miscellaneous parts, worth \$30. College student must sell, all for \$350. K200G, David Herskowitz, 1590 East 26th St., Brooklyn 29, N. Y.

FOR Sale: Wilcox 96C RF deck only, complete with tubes, \$200; FCG terminal unit, \$150; OR/5 frequency shift osc., \$50. W7KV.

CHANCE Of a lifetime! Factory-converted BC610E and BC614E. Original circuits. Wiring has not been altered, Complete with original manual and calibration data, \$450. W. A. Barker, W5LLV, Box 1219, Denton, Texas.

SALE: Six and Two 0 Johnson transmitter, \$110, in excellent condx. W31HF, 31 North Grant, Waynesboro, Pa.

WANTED: 833A. State price and condition. Have shipping container. W2JAO, E. Brinkerhoff, 149 Summit Ter. N., Kinnelon, N. J. FOR Sale: Complete SSB transmitter. Central Electronics 600-L amplifier; 20A exciter with QT-1 and Deluxe 458 VFO, \$540. W9RHE, 6920 N. Medford, Chicago 46, III. Tel. RO 3-2360. 10 Mr. Converterette \$8.50; 10 or 15 mtr. Preselector, \$4.50. W6RET, 8831 Sovereign, San Diego 11, Calif.

VIKING Courier 200-500 wat amp., used 20 hours, in perfect condx: \$229. Will consider mobile equipment as part pay. Also Ranger \$195. Charles Kunde, 5770 Gary Ave., Roselle, Ill. Deliver Chicago area free!

Chicago area free!

RECONDITIONED and guaranteed. Satisfaction guaranteed. Terms financed by us. Hallicrafters S38 \$29.00; S85 \$39.00; SX99 \$119.00; SX96; SX100; SX101; HQ100 \$139.00; HQ110 \$189.00; HQ140; HQ150; National NC98 \$99.00; NC125 \$129.00; NC300 \$279.00; HR050T; HR060; NC183D; Globe Scout \$69.00; Viking II; Ranger, Valiant; Pacemaker; Thunderbolt; Heath DX35; DX100; Collins 32V; 75A2; 75A3; 75A4; etc. Many other items. Write for free list. Henry Radio, Butler, Mo.

JOHNSON 6N2, excellent, \$120. Want: 6V. Gonset noise clipper. W6VMO.

Walking of the control of the contro

CANADIANS: Sell Globe Scout 65B, \$100, good condition, Nick LeMoine, Ve2ALU, 608 Argyle Ave., Westmount Montreal, Que-bec, Canada.

I Collect old telegraph keys. What have you? Virginia Zitzow, WIHGM, 11 Oak St., Reading, Mass.

MOBILE Gonset G77 transmitter, G66 receiver, 3-way Universal power supply complete with all cables. Used one month. Price: \$395. Murray McKee, 1911 Fifteenth St., Columbus, Ind.

SELL: Two 3X2500F3 Eimac tubes, in used condx. Make an offer-K1ABE, 130 Bishop Ave., Rumford 16, R. I.

COLLINS late model 75A-3 with 3 Kc mechanical filter, crystal filter, used less than 50 hours, perfect condition, \$390; DX-100 used little, beautifully wired, \$170; Johnson 250 watt Matchbox, \$40; Heath antenna impedance meter, \$10. Will ship C.o.d. Jim Thompson, WgTRT, 509 7th Ave., S.W., Rochester, Minn.

CHRISTMAS Specials! New Guarantee! Many ready to ship, Prices ONLY on DECEMBER orders: QF-1 \$8,95; Seout 6804 \$89.95; Seout 680 884.50; DAZ\$ \$82.50; SX-7! \$155.00; LAI linear \$89.95; SM90 modulator \$9.95; NC183D \$319.00; NC300 \$299.50; King 500 \$425.00; TBS50 \$67.50; 32V-2 \$339.00; 32V-3 \$489.00; Champion 300 \$349.50; MC-55 converter \$38.50; B&W 518B \$189.00; Johnson KW with desk \$1,150.00; HT-30 SSB \$339.00; HT-31 linear \$289.00; SSB-100 \$395.00; Planear SSB \$100 \$489.50; Champion \$400; SSB-100 \$489.50; Planear SSB \$1,325.00; Champion \$400; SSB-100 \$489.50; Planear SSB \$1,325.00; Planear S Bluffs, Iowa

DIAGRAMS for surplus electronics. Stamp for list. Alvaradio, P.O. Box 151, North Hollywood. Calif.

FOR Sale: SX-71 receiver, \$125. Aligned and checked and in vy gud condx. 18 amp. Variae, exc. condx. \$18. Gary, W1FEU, 109 Mohegan Ave., New London, Conn.

Ave., New London, Conn.

SELL: Latest Viking Ranger, in perfect condx, factory-wired, tested, push-talk, original carton, operating manual, w/Electro-Voice mike, \$185. F.o.b. A. Diament, 28 Devonshire Place, Bridgeton, N. J. JOHNSON Match-box, like-new condx, \$35; Viking II and VFO, gud condx, \$200. Want HRO. K9HYB, Madison, Ind. Rte #4.

SELL DX-100, In gud condx, first \$115 takes it! Ed Hemlow, W2DKO, RFD #1, Fishkill, N. Y.

HEATH DX-100, \$185. Lad Jelen, Rt. #4, Medina, Ohlo.

FOR Sale: LA-400-B, factory-built, in new condx. Money back guarantee, \$125; Mosley Tri-Band beam, 15-20-40 w/TR-4 rotator and mast, \$125. George Steed, W5BUX 1605 Redlings Drive, Okla-

and mast, \$125. George steed, W5BUX 1005 Redings Drive, Oklahoma City, Okla.
TECRAFT 2-meter converter, 14-18 Mc. output. Factory-wired, red-hot with reasonably good receiver. Now have NC-300 w/converters. \$24.95. Fo.b. Jenkintown, Pa. L. Sharpless, W3ULC, 213 York Road.

SELL: HQ-129X 100 Ke xtal osc. frequency standard and matching speaker, \$130.00. Larry Bauer, W8GWS, 514 W. Hardin St., Findlay,

MERRY Xmas and a Happy New Year from WØCVU. Congratutions to OKIMB winner of the WØCVU Gold Cup for varified 100th country Two Way SSB QSO with WØCVU.

SELL: National NC-300, excellent condition, xtal calibrator, matching speaker, \$270.00. W4SGY, Paul Southworth, 739 Lakehurst, Lakeland, Fla.

HAMMARLUND "Pro 130" like new condx, in original craims, \$325.00. Also have brand-new AN/FGC-1 teletype terminal unit with standard 2125 and 2975 filters. Weighs 525 pounds crated. \$200 t.o.b. Tulsa, Sam Goldish, W5TVG, 3830 South St. Louis Ave., Tulsa, Okla.

SALE: NC-188, \$90; Heath Q-multiplier, \$7.50. Both together, \$95. Wanted: BC-348, Q5'er. Will ship. K3AMU, 205 N. 28th St., Allentown, Pa.

HAM Licenses, resident courses, Novice and General classes. 3 evenings weekly. Delehanty Institute, 117 East 11th St., New York City 3. Tel. GR 3-6900.

City 3, Tel. GR 3-6900. DETROIT Hams! W8BPB must curtail operations, Complete deluxe KW phone with push-pull 4-2504 final, push-pull 810 modulators, remote controlled. Rack mounted. Antenna tuner, filters, speech compressor, splatter filter and many other features. Power supplies separately mounted, integrated with full complement of relays. This station will be sold at a tremendous sacrifice. It can be seen at 16020 East Warren Ave., Detroit. Phone: TUxedo 4-4014. Hurry! Make an offer! Harold Feighner, W8BPB.

WANTED: 75A2 receiver. State price, condx, etc. W4NI, 3600 Old Vineyard Rd., Winston-Salem, North Carolina.

ELMAC AF-67 transmitter, PMR-7 receiver, and James 6-12-110 volt mobile power supply for sale: \$275. All brand new, never used, Marshall Lincoln, KN9KTL, 3558 Forest Grove, Indianapolis 5, Ind. LEECE-NEVILLE! 100 amp, 12 volt system, complete, in gud condx, \$65 or will swap on Comm. SSB generator. Give best deal first letter. Tower, 65′, triangular steel Aprodeo, in gud shape, \$50 or swap on Comm. SSB equip. Give best deal first letter. All reasonable replies answered. W505V, 6032 Walnut Dr., Ft. World, Texas, 100 SED, 100 S POWER Transformer, primart 110. Secondary 1600–2700–3000 at 1000 mils CCS, custom-built by UTC, \$45. Want old Halllerafters long-wave receiver. W3CFD, Boye Hagerty, Honesdale, Penna.

ALUMINUM from Dick's, plus your ingenuity, will make you the best beam for less. Write today for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits. Dick's, WSIJL, Cherry Ave., Route I, Tiffin, Ohio.

VALIANT, NC-300, both now on air, in perfect condx. Priced for quick sale. \$265 each. Reiter, K9DBL, 240 Powell Ave., Clarendon Hills, Ill. Tel. FA 3-0085.

NC-173 receiver for sale, \$135.00. Excellent condx. Clean. Like-new appearance. Will ship. C. Brooner, Box 261, Morton, Ill.

appearance. Will ship. C. Brooner, Box 261, Morton, Ill. OKLAHOMA Kilowatt, P.P. 813s, final, phone D.S.B., 2000 watts P.E.P. B&W KW coils 10, 40, 80, table-top rack, \$175 delivered in Oklahoma; 6 foot cabinet, \$35. Speech amplifier P.P. 805s, mod. for 813 final, \$35. Phone 1006, Edmond, Okla., 316 E. Hurd St., Allen Watson, 316 E. Hurd, Edmond, Okla.

INSTRUCTOGRAPH: Ten tapes, American Morse Code. A.C. oscillator, key, phones. In gud condx. Half price. W. Mahoney, 257 West 20th St., New York 11, N. Y.

West 20th St., New York II, N. Y. SELL: DX-40, \$60; Heath VFO \$16; HY-Gain 14 AV trapped vertical antenna complete with 14RMK mounting kit, \$23, K50MR, 5934 S. Alameda, Corpus Christi, Texas. All above in perfect condx. SELL: HQ140X, \$150; Johnson Matchbox, \$35; D104 mike w/stand, \$12, All in excellent condx. Mort Brody, 248 Locust, Indiana, Pennsylvania.

COLLINS 75A3, serial #1655, last model like new, with calibrator manual. \$375. W2EDF, George Orgera, 8 Bayview Ave., Islip, N. Y

SELL: Meissner 150-B phone/c.w. xmttr with VFO in vy gud condx. Complete with tubes, manual, and major spare parts. Has 1600 volt power supply, 813 final, pair 811 mod., \$195. WIAJZ, 38 Ayer Lane, Harwichport, Mass.

VIKING II with VFO, SX-71. Used six months. Excellent condition First \$300 takes all three. Paul Jenkins, 210 Flith Ave., N. Y. 10, N. Y.

SELL: Viking Ranger A-1 condx, \$150; SX-28A, excellent, with speaker, \$100; Millen R-9er 10-meter coil, \$8. J. R. Booker, W5ADC, Holdenville, Okla.

WANTED: 40W plate modulator, also any 6v. mobile gear. Write me prices, condx, etc. Glenn Metzler, KN3DHV, Manheim, Penna. COLLINS KWS-1 and 75A-4, year and a half old. Revr has 3.1 Ke and 800 cycle filters, \$1900. Will consider trade on Piper Tri-Pacer or Cessna 172 airplane. W6NQU, 12712 Elmeroft Ave., Norwalk, California.

EARLY new Mon-Key, in perf. condx, with schematic, \$30. Rev. L. Battin, 616 Glenwood 1, Elgin, Ill. W9OWD

IRE Proceedings, 1949 to 1958; Electronics, 1951 to 1958, Make offer, E. W. Kindall, W7GUW, 4106 41st Ave., S.W. Seattle 16, Wash offer. Wash.

wash.

SELL Or trade: H-W TBS50D with AC supply, \$85; Morrow 3BR converter, \$25; Dynamic mike grip-to-talk stand, \$18; BC348 with AC supply, \$65; Knight VFO, \$28. Will travel 100 miles for 75A1-2, NC-500 or HRO. Middleton, K2UTT, 241 Fairmount, Liverpool, N. Y.

N. Y.

SCR-522 transmitter-receiver with all eighteen tubes. Ideal set for 2 and 6 meters \$25.00. Also have SCR-522 parts, send needs. Collins ART-13 transmitter, perfect condition with all tubes \$95.00 ART-13 modulation transformer \$8.50. ART-13 audio driver transformer \$3.50 ART-13 glass S-116 vacuum switch \$8.50, clip in fuse type vacuum capacitors 50mmf \$3.50, 25mmf \$5.50, 12mmf \$12.00, ARC-5 receivers BC-453 \$10.00, BC-454 \$8.00, BC-455 \$8.00, transmitters BC-457, BC-458, BC-459 \$6.50 each, BC-221 frequency meter, with original calibration book \$60.00. Wanted: AN/CRT-3 S.O.S. victory girl transmitter, also ARK-30 sets. All guaranteed, C.O.D.'s OK, Bill Slep W4FHY, Box 178, Ellenton, Florida.

FOR Sale: Viking KW amplifier, \$1000; 75A3, \$350. W. R. West, 830 West 21st St., Norfolk, Va.

FOR Sale: Collins 32V3 and B&W 51SB, Collins 75A4 late, TR switch. First \$1000. Prefer local deal. W6HXZ, Redondo Beach, Calif.

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FOR Sale: Viking Valiant, Hallicrafters S76, matching speaker, D-104 mike with push-to-talk stand, Bud low-pass filter; 60 watt 6 meter transmitter, modulater and power with Valiant, push-to-talk; co-ax relay, 50 Ft. tower, AR-22 rofator, 6 meter beam, all in excellent condition, complete, \$325; prop pitch with transformer, \$25; Instructograph 10 tapes, \$25. O. L. Gilbert, KØBLE, New Prague, Minnesotte. Minnesota

FOR Sale: Los Angeles area only! Presto 7K professional disc recorder, 33½, 78. Has good quality playback. Also, miscellaneous items and books. Send for list, Box 106, Downey, California.

SELL: Collins 32V2, excellent condition, with coax relay and spare 4D32, \$300. You pay shipping, WöRLU/4, Bill Bettis, 2808 N. John Marshall Dr., Arlington 7, Va.

SELL: Gonset 10-11 meter converter, \$15; never used Lysco 10 meter xmitter, \$18; PE103 dynamotor, \$15; LM7 freq. meter, \$25; Johnson Mobile all-band coil, \$8; Heath balun coil, \$6. W2OJC, 54 Charles St., Clifton, N. J. PRescott, 9-0639.

VIKING KW with table, \$1150. Ranger, \$195, in exc. condx, both \$1250. Will deliver within 250 miles or F.o.b. Wichita, Kansas. J. H. Fugate, 606 Schweiter Bldg., Wichita, Kans.

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RME 4350, perfect, \$160; new General Electric 500 watt modulator Class AB1 4-250A's; 68K7, 68N7 driver stages, many features, enclosed with tubes, output impedance 5000 to 7800, \$180; Globe Scout 680A, like new, factory-wired, \$70; new power transformer 60 eyole, 220 volt primary 5000 volt centertapped, 400 milliamper output, \$30; 1000 VA constant voltage transformer, 50 cycles 110/220 input 110 output, \$50. J. Swift, 1381 Richmond Ct., East Meadow, L. I., N. Y.

GOING SSB. Will sell NC-173, excellent, \$100; GPR-90, like new, \$300; 50-watt VFO rig, \$40, 30 watt plate modulator with power supply, \$40; Lynmar TR switch, \$8: Heath antenna coupler, \$10; W21EY, 64-194 186 Lane Apt. 1A, Fresh Meadows, N. Y. NYC, call 01 8-8757.

HRO5OT1, w/spkr, and colls, A, B, C, D, Telrad 18A standard, 1000 Kc, 100 Kc, ad 10 kc. Best offer cash or will consider smaller receiver as part trade. Michael J. Marshall, 455 Washington Ave., Dumont, N. J.

SPECIAL SALE: GPR-90, GSB-1, Speaker \$425. Hammarlund SP400X \$195. HRO-60, calibrator, speaker, Colis A, B, C, D, E, F, AA, AC, AD, \$395. Johnson Five Hundred transmitter \$525. Courier amplifier \$210, 32V-1 \$295. KWS-1 \$1150. Gonset Communicator 2 meters 6 volts \$129. Want: teletype printers, reperforators, BG-342, BG-321, BG-342 and other surplus in trade for new Johnson Vallant, Thunderbolt, National 303, HQ-170, Towers, Antennas, Rotators, Fisher Hi-Fi, Bell etc. Write Tom, W1AFN, Alltronies-Howard Co. Box 19, Boston, 1, Mass. Richmond 2-0048. Stores: 278 Friend St., Boston (near North Station) 60 Spring St., Newport, R. I.

WILL Trade — Viking II for portable tape recorder. Sell 288X signal generator; 156 Traceometer; 209A VTVM; 600A tube tester; all Hickok, 0-8 Heath scope. Paymaster check writer. S-38B. Charles Vangsgard; Box 112, Luck, Wisconsin WILL Trade -

PARTS for BC-348 Models, H, K, L, R. Write for list. Panoramic Adapter ID-60/APA maintenance manuals, \$2.75; BC-312 and BC-191 maintenance manuals, \$2.50. Electronic att, Box 269, Bronxville 8, N. Y.

GLOBE Chief w./3 novice xtals \$45. WRL 755 VFO unused \$49. WRL screen mod. unused \$9. All in exc. condx. w/instructions. All for \$99. Will trade for DX40. Ans. all letters. K4OVF, Jerry Minchey, Westmoreland, Tenn

Westmoreland, 1enn.

SELL: Ranger, \$190; SX-100, \$200; Johnson TR Switch, \$15; DX-35, \$40. All are absolutely perfect. K6VSF, 13837 Sunset Blvd., Pacific Palisades, Calif. GRanite 7-1619.

ELMAC AF-67, Pel0IC Dynamator for Elmac, and Gonset Super-Six — make offer. Tom Moore, 1021 Cecil Place N.W., Washington 7,

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SELL National NC-125 receiver, Heathkit DX-35 transmitter, VF-1 vfo, and V7-A vacuum tube voltmeter. Make offer. Grant Brooks W3JLL 19 Shady Ave., Greenville, Pa.

COMPLETE mobile station, AF67 Elmac, Gonset 66G, Dynamic mike, all band antenna, all perfect condition. First reasonable offer gets it. W5HUT, 1141 Frenchmen Street, New Orleans, La.

gets it. W5HUT, 1141 Frenchmen Street, New Orleans, La.

ELMAC A-54, 10-15-20-40-80, PSA-500 A.C. power supply, 12V
dynamotor, using it to drive a Meissner 150-B, 250 watt phone or
C.W. operates all bands. Screened and by-passed for TVI suppression, crystal mike input. All for \$250. W3YVO, C. W. Hoffmeister,
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SELL; Collins 75A2, clean, calibrator, Central Electronics Model B
SSB silcer, \$350. Wanted; 75A4. W2DTE 29-29 213th Street,
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MOBILE: 12v Morrow Twins, complete rig: stainless whip and
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Speaker; filter caps; spare dynamotor; cables, etc. Flawless. Used one
season. Will ship. Steal it for \$350. Write: Uncle Dick Tlapa,
K9DNR, Box 183, Cicero, Illinois.

HEATHKIT DX-40 for sale. Perfect condition. Highest bidder over \$65 takes it. Richard Bennett, 981 Pacific St., New Milford, N. J. VALIANT transmitter for sale, Like new perfect condition, \$300.00 FOB Morrisville, Pa. W3ARR 11 West Hedgerow Dr. CY5-5564 HRO colls G, H, and J wanted, W5KYK.

FOR Sale: Collins 75A3 receiver SN-1605. Very good condition \$335. John A. Pierce, 203 Chestnut Ave., Westmont 7, N. J.

GONSET 6 meter comm. 11 12 volt 4 xtal sockets, \$179; viallant factory wired, \$319; NC125, \$119; NC183D, \$299; HRO50-T, \$199; SX25, \$57; VHF152A, \$42; all guaranteed like new cond. FOB Chicago 35, Treger W9IVJ-2023 N. Harlem Ave.

SELL: 20A, QTI, VFO, 250 watt all band amplifier, \$300; HQ14OX, DB20, speaker \$220; hickok 505 scope \$125, W5GTR, 1303 Louisiana, McKinney, Texas.

TO settle an estate, complete AM, CW, and SSB station for sale-75A-4 with 3 Ke, filter and speaker, \$500.00; B&W 51SB-B, \$175.00; B&W 5100, \$350.00 All in perfect condition. Above plus mike, key, etc., for \$825.00. Terms to responsible party. W5GEL, 1021 Vaky St., Corpus Christi.

St., Corpus Carlisti.

200 WATT Phone WRL Linear LA-1 \$85,000! S-106 Six Meter Receiver \$35,00. Tapetone XC-50 Six Meter Converter, 14-18 Mc, I.F. \$40,00. Heath VFO-1, wired and Calibrated. Unused \$15,00. All like new, with manuals, plus shipping. Wallie Anderson K8JBH, 5743 Parkland, Parma 30, Ohio.

5743 Parkland, Parma 30, Ohio.

SELL OT Trade: 1 Hallicrafters VFO-HT18, \$40; 1 Heath Mod. O-8 'scope, \$30; 1 Millen R9er, 10m coil, \$10; 1 UTC S74 transformer, \$10; 1 UTC 225 Mc. choke, \$5; 1 4-6-5 tube, new, \$8; 1 4-125 tube, new, \$10; 10 2E26 tubes, \$1.50 ea. 1 Maliory 300V 200 Ma pack, \$12; 1 Maliory 400V150 Ma pack, \$12; 1 Carter Dynamotor 600V 170 Ma., \$6. Want: DX-35 or some small transmitter, receiver or what? R. Athearn, P. O. Box 4045, Gary, Ind.

NEED DXCC or WAS confirmations? International Reply-Paid QSL's will help! 25, \$1.00. Sample Free. Hart Industries, 467 Parke Birmingham, Michigan.

SAVE time and money with our customized, prepunched chassis and panels. Send specifications. Also aluminum sheets, tubing, rods, angles. Write for price lists. Electronic Chassis Company, Box 1225, Boston 4. Mass.

FOR Sale: New BC-645 — \$18.00 — Jim Halverson, K9IBI, 227 Broadway, Eau Claire, Wisconsin.

75A2 and speaker. Good condition. Best offer over \$300. Viking I and Viking VFO. TVI suppressed, push to taik, time sequence keying, spare 829B, mike, key, low pass filter, coax relay. \$150. Heathkit Q multiplier \$7.00. Thomas O. Crow, W6HGW, 901 Robertson Way, Sacramento 18, Calif.

FOR Sale: Perfect DX-100 with heath swr bridge, Johnson 1 Kw lowpass and all necessary connectors; NC-183, SX-99, both with speakers; Chicago Standard potted components plate xformer, pvi. 115V., sec 1800 V.C.T. @ 400 mils, choke 5.5. hys @ 400 mils. Call or write, all will be answered. Joel Narod, 80 Clarkson Ave., B'klyn 26, N. Y., K2YBI.

HALLICRAFTERS HT32 for sale. Good condition. \$550. Walter Porter, WØUJC, 312½ North St., Marshalltown, Iowa.

FOR Sale: Viking I, TVI shielded, with coax antenna and plate power relays, \$160; Heath VFO, \$20; NC98 Receiver, \$120; All in excellent condition. Reason for selling: need money for college. Shipping charges extra. Fred Mertin, W5YHT, 335 N. Gregg, Fayetteville, Arkansas.

HALLICRAFTERS — HT-33 Kilowatt Linear. Full output with any 15 watt exciter. Ten hours operation. Original carton. Warranty card. Payment of bad debt. Am SWL and cannot use. New \$775.00. Want \$550.00. Freight collect, No haggling. Phil Lectro, 187 Culver Road, Rochester, N. Y.

SELL: Heath DX40, \$63; VF-1, \$18; Hallicrafters S-85, all in perfect condx. Robert Leinwand, 108-20 62 Dr. Forest Hills 75, L. I., N. Y. K2EMD.

FOR Sale 3 ca New 4-400A tubes @ \$20.00 ca. Gonset G-66B Receiver factory converted to E Model complete with universal power pack \$190.00. Lesly W. Williams, P. O. Box 794, Nutting Lake, Mass.

KILOWATT Amplifier with power supply using push-pull 810's and fully inclosed R.F. section plus an 813 driver unit, \$35 worth of trans-mitting tubes, and antenna tuner, \$165. Dave Ranney, Box 590, Yankton, South Dakota.

SELL: College forces sale of my DX-100 with push-to-talk, co-ax relay, etc., HQ-140-X with Heath Q-multiplier, both used only one year, in excellent condx. Also: Heath Grid Dipper, Vibroplex bug, QST's 1949, 54-57 complete. Best offer takes one or all. Ross Harris, W1ARU, Kirkland B-24, Cambridge 38, Mass.

WANTED: Coils for 160 meters for Hallicrafter HT-9 Transmitter; W9PKA Arthur F, Maknke, 23 156th Place, Calumet City, Illinois. FOR Sale: HT-32: \$535. Used very little, in excellent condition. Need money for school. George Reazer, W8KYH, 1083 Selwyn Road, Cleveland Heights 12, Ohlo.

SELL: NC 183D Receiver, like new, with speaker and silicer \$260. Johnson Viking I in Viking II cabinet. New condition with VFO — \$150. W2HFM, 60 Lindgren, Merrick, N. Y.

ANY kit wired and tested. Send for price list. A. Breiner W3ZRQ, 212 Race Street, Tamaqua, Penn.

SELL: Complete station. NC-173, \$115; SW-54, \$30; DX-35, \$45 Harvey Wells TBS-50C & P.S., \$75; Heath VF-1, \$15; Knigh 100-kc. calibrator, \$7; Gonset 2M converter, \$30. All perfect and with instructions. Bob Hanway, 823 Vermont Avenue, Fairmont West Va. K8GNZ.

SELL: 813 Power Amplifier with antenna tuner and 3 foot relay rack — \$65. New Heathkit Q Multiplier, assembled — \$12. VFO with built-in power supply — \$16. Dennis McNeal, 8411 Walnut, Munster, Indiana.

SELL: Neat homebrew 60W 80-40M CW XMTR. W/3xtals, mtr etc. Compl. \$25.00. R. Sylvan W9CBT, 4816 N. Avers, Chicago, Ill. CO.7-9356.

SELL or trade: 4 — 250A final amplifier for 6, 10, 15 meters; Blas, screen, and plate supplies for 1.5 kilowatts. 6 meter exciter, 15 watts, 2E26, 12AT7; all in one rack, sold together for \$250.00 or stero equipment. D.C. Flowers, K4GAI, 811 Drewy St., Atlanta 6,

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SAVE \$40 on new HQ-160, \$340 plus shipping. Thomas Gavan, 225 West Broadway, Apt. C-2, Long Beach, L. I., N. Y. GEneral 1-400s, SELL: Super Pro, rack mounting, converted, no surplus, \$125; WRL 755 VFO, \$40; TV boosters for 6 & 2 meters, \$15; S39 Portable, \$40. Want KE93. Chester Benson, W91FB, 333 So. 5th, Richmond, Indiana.

WANTED: Collins 75A-2 in A-1 condition. No modifications. State serial number. W8KEO, Bellaire, Mich.

2-METER Gonset Communicator II 6 volt. Excellent condition, Good buy at \$145.00 cash. William Batte, 146 Westbrook Dr., Hampton, Va.

VIKING II, VFO, no modifications, daily use, guaranteed excellent, original carton, \$197 or 10% under the lowest price advertised in last month's HAM-ADS, whichever is lower, Went SSB. W4VDY, Box 1023, Tavares, Florida.

MERRY Christmas and best wishes for DX for another wonderful year to all my friends both old and new. Uncle Charlie How.

SELL: Viking 1, \$125; SX-28 with spkr \$85; Underwood 5 type-writer, \$25. All excellent condx. Gill DeBard, K7BJB, 840 Reeves, Reno, Nevada.

FOR The Best deal in new and used Ham Gear, try Bob Graham, W1KTJ, 505 Main Street, Reading, Mass. Reading 2-4000 (Graham

FOR Sale: Johnson Viking 500, factory-wired Ser. No. 42342, like new, \$695; Collins 75A4 latest model Ser. No. 4786 with matching speaker, light and clock, 300 Kc filter, \$585; Johnson Adventurer, two Novice xtals, \$40; BC-458 converted for 80 meters, 5X shaped keying — 115V power supply, \$35; BC645, unused, all tubes, \$12.50. Need the money. W4FVS, 2145 Brookview Dr., N.W., Atlanta 18, Ga.

FOR Sale: DX100 xmttr, wired in 1958, \$189.50; Lysco 600, VFO, TVI-suppressed c.w. xmttr with model 50 tuner, \$55; SX-96 revr and spkr, \$150; Hy-Gain model 18AV Multiband vertical antenna, \$40. Prices basis Casper, Wyoming, P.O. Box 2471, Joe Prochaska,

W7BHH.
FOR Sale: Collins 32V3 with low pass filter and antenna relay, \$425.
Collins 75A4 and speaker with built-in extras in speaker cabinet,
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MArket 4-8453, 2302 N. Main, Ft. Worth, Texas.
NEED CASH for college: Will sacrince parts for KW amplifier
(Page 187, 1955 Handbook). Everything mounted, you just solder.
Less tube and power supply, \$50 postpaid. Heathkit direct reading
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Kingsley Ave., Palo Alto, Callf.
WANT KWS-1, sel 1800-1. \$330: 20A with 458VFO. 10 maters con-

Many KwS-1; sel 1600-L, \$330; 20A with 458VFO, 10 meter converter, and Q7-1, \$180; 250W Matchbox, \$30; DB23, \$20; all new condition except DB23, W6WZD, P.O. Box 761, Menlo Park, Calif. FOR Sale: WRL 300 xmttr Globe Champion, \$300; RME \$100; K6BYE, 6533 W. 86th Pl., Los Angeles 45, Calif. ORchard 2-8873.

SALE Or Trade: One 304TL, two 813 tubes, R.C.A. Signal Generator Model WR-67A. Want Grid Dip Meter, DB-23, Mon-Key, VHF 152-A, etc. WIRDC, 917 Homestead Ave., Holyoke, Mass.

I ARRL? K2VDJ.

SELL: 32V3 factory-converted from V1. \$350. Virgil Schaffer, 3165 Grove Court, Cedar Rapids, Iowa.

SELL: SX-100 receiver, excellent condition, \$200 plus postage. John Morgan, K9BLX, P.O. Box 610, Cary Hall, Lafayette, Ind. Telephone 92-81241.

S38D receiver (Hallicrafters) for sale. \$30 plus postage. Walter Steen, Woodstock, Conn.

VALIANT, month old, \$365; SX-99, \$115; Adventurer, \$35; Heath SWR meter, new, \$18; Matchbox, \$35. Going to college, need the money. K4RTA, 3927 Ivy Dr., Nashville, Tenn.

FOR Sale: SX-62 with speaker, in perfect condition, \$160. Will be willing to ship, Paul E. Dudley, W5DYS, Trumann, Arkansas.

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Miniaturized, packaged panel mounting cathode ray oscilloscope designed for use in instrumentation in place of the conventional "pointer type" moving coil meters uses the 1" 1CP1 tube. Panel bezel matches in size and type the standard 2" square meters. Magnitude, phase displacement, wave shape, etc. are constantly visible on scope screen.

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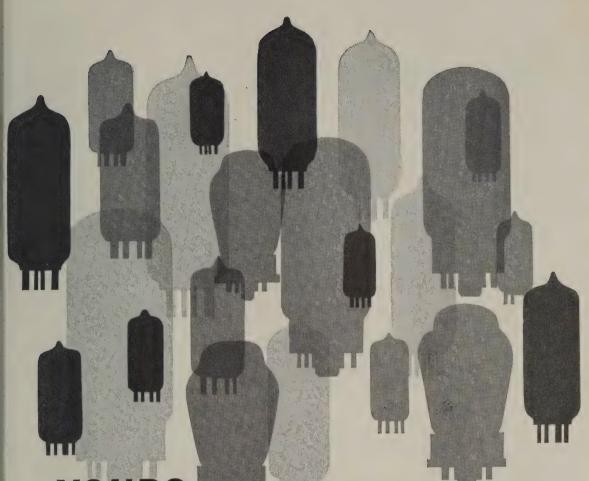
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(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K) Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K).  Three-Phase Power Supply for Mobile Use (Jennings). Time Signals on the Gonset Super 6 (H&K).  Transistorized B.F.O. for Mobile Use (H&K).  Transistorized Power Supply (Chambers).  Feedback.  Transistor Mobile Converter (DeMaw).  Transmitter Hunting on 75 Meters (Isaacs).  Tubless Conversion for 75-Meter Mobile (H&K).  Tuning the Heliwhip to Frequency (H&K).  Two-Band Halo for V.H.F. Mobile, A (Tilton).  Two-Tube Mobile Transmitter (Westrem).  Using Film Reels as Capacitive Hats (H&K).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 68, 11, 24,	Mar. July Mar. Jan. Aug. Feb. Mar. Oct. June Apr. Dec. Sept.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342. Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super' Receiver, The (Goodman). Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K). Squelch Circuit for Hallicrafters S-85 (H&K). Three Modifications for the NC-300 (Hastings). Time Signals on the Gonset Super 6 (H&K). Transformerless Version of W3DM's T.R. Switch (H&K). Transistorized Keying Monitor With Speaker (Tipple). Transistorized Q Multiplier (Campbell). Transistorized Tunable Converter, A (H&K). Transistor Mobile Converter (De Maw). T.R. Switches (H&K).	43, 68, 14, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51,	May Dec. July Dec. July Dec. Mar. Apr. Aug. Feb. Mar. Jan. Dec. Oct. Sept.
(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K) Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K). Three-Phase Power Supply for Mobile Use (Jennings). Time Signals on the Gonset Super 6 (H&K). Transistorized B.F.O. for Mobile Use (H&K). Transistorized Power Supply (Chambers). Feedback.  Transistor Mobile Converter (DeMaw). Transmitter Hunting on 75 Meters (Isaacs). Tubless Conversion for 75-Meter Mobile (H&K). Tuning the Heliwhip to Frequency (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Tube Mobile Transmitter (Westrem). Using Film Reels as Capacitive Hats (H&K). Using Film Reels as Capacitive Hats (H&K). Using the Gonset Super-Six Ahead of a Command Re-	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 68, 11, 24, 69,	Mar. July Mar. Jan. Aug. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342 Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super'' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch for the NC-300.  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transformerless Version of W3DM's T.R. Switch (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Gonverter (Campbell).  Transistorized Tunable Converter, A (H&K).  Transistor Mobile Converter (De Maw).  T.R. Switches (H&K).  Tubless Conversion for 75-Meter Mobile (H&K).	43, 68, 14, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51,	May Dec. July Dec. Mar. Apr. Aug. Feb. Mar. Jan. Dec. Oct.
(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K) Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K).  Three-Phase Power Supply for Mobile Use (Jennings).  Time Signals on the Gonset Super 6 (H&K).  Transistorized B.F.O. for Mobile Use (H&K).  Transistorized Power Supply (Chambers).  Feedback.  Transistor Mobile Converter (DeMaw).  Transistor Hobile Converter (DeMaw).  Transistor Hobile Converter (Mak).  Tuning the Heliwhip to Frequency (H&K).  Tuning the Heliwhip to Frequency (H&K).  Two-Band Halo for V.H.F. Mobile, A (Tilton).  Two-Tube Mobile Transmitter (Westrem).  Using Film Reels as Capacitive Hats (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 68, 11, 24, 69,	Mar. July Mar. Jan. Aug. Feb. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342.  Receiver for the 50-Mc. Man, A (Brandt).  'Simple X Super'' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch for the NC-300.  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transformerless Version of W3DM's T.R. Switch (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Q Multiplier (Campbell).  Transistorized Tunable Converter, A (H&K).  Transistor Mobile Converter (De Maw).  T.R. Switches (H&K).  Tubless Conversion for 75-Meter Mobile (H&K).  Using the Gonset Super-Six Ahead of a Command Re-	43, 68, 14, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51, 84,	May Dec. July Dec.  July Dec. Mar. Apr. Aug. Feb. Mar. Jan. Dec. Oct. Sept. Apr.
(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K) Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K).  Three-Phase Power Supply for Mobile Use (Jennings). Time Signals on the Gonset Super 6 (H&K).  Transistorized B.F.O. for Mobile Use (H&K).  Transistorized Power Supply (Chambers).  Feedback.  Transistor Mobile Converter (DeMaw).  Transmitter Hunting on 75 Meters (Isaacs).  Tubless Conversion for 75-Meter Mobile (H&K).  Tuning the Heliwhip to Frequency (H&K).  Two-Tube Mobile Transmitter (Westrem).  Using Film Reels as Capacitive Hats (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  100-Watt Transistor Mobile Power Unit (Karl).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 68, 11, 24, 69,	Mar. July Mar. Jan. Aug. Feb. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb. Apr. June	Pierson KE-93 Receiver, The (Rec. Equip.).  Q Multiplier for BC-312 or BC-342. Receiver for the 50-Mc. Man, A (Brandt).  'Simple X Super'' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transformerless Version of W3DM's T.R. Switch (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Q Multiplier (Campbell).  Transistorized Tunable Converter, A (H&K).  Transistorized Multiplier (De Maw).  T.R. Switches (H&K).  Tubless Conversion for 75-Meter Mobile (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).	43, 68, 14, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51, 64,	May Dec. July Dec. Mar. Apr. Aug. Feb. Mar. Jan. Dec. Oct. Sept. Apr.
(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K) Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K).  Three-Phase Power Supply for Mobile Use (Jennings).  Time Signals on the Gonset Super 6 (H&K).  Transistorized B.F.O. for Mobile Use (H&K).  Transistorized Power Supply (Chambers).  Feedback.  Transistor Mobile Converter (DeMaw).  Transistor Hobile Converter (DeMaw).  Transistor Hobile Converter (Mak).  Tuning the Heliwhip to Frequency (H&K).  Tuning the Heliwhip to Frequency (H&K).  Two-Band Halo for V.H.F. Mobile, A (Tilton).  Two-Tube Mobile Transmitter (Westrem).  Using Film Reels as Capacitive Hats (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 68, 11, 24, 69,	Mar. July Mar. Jan. Aug. Feb. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342 Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super'' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Greuit for the NC-300.  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transformerless Version of W3DM's T.R. Switch (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter, A (H&K).  Transistor Mobile Converter (De Maw).  T.R. Switches (H&K).  Tubless Conversion for 75-Meter Mobile (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  Variable Band Width for the Heathkit Q Multiplier (H&K)	43, 68, 14, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51, 64,	May Dec. July Dec.  July Dec. Mar. Apr. Aug. Feb. Mar. Jan. Dec. Oct. Sept. Apr.
(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K).  Three-Phase Power Supply for Mobile Use (Jennings).  Time Signals on the Gonset Super 6 (H&K).  Transistorized B.F.O. for Mobile Use (H&K).  Transistorized Power Supply (Chambers).  Feedback.  Transistor Mobile Converter (DeMaw).  Transmitter Hunting on 75 Meters (Isaacs).  Tubless Conversion for 75-Meter Mobile (H&K).  Tuning the Heliwhip to Frequency (H&K).  Two-Band Halo for V.H.F. Mobile, A (Tilton).  Two-Tube Mobile Transmitter (Westrem).  Using Film Reels as Capacitive Hats (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  100-Watt Transistor Mobile Power Unit (Karl).  6-Meter Hearsemobile, The (Weissbrodt).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 68, 11, 24, 69,	Mar. July Mar. Jan. Aug. Feb. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb. Apr. June	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342. Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super'' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transformerless Version of W3DM's T.R. Switch (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter, A (H&K).  Transistorized (H&K).  Tubless Conversion for 75-Meter Mobile (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  Variable Band Width for the Heathkit Q Multiplier (H&K)  144-Mc. Converter Design and Adjustment, Hints on (Burson).	43, 68, 14, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51, 64, 63, 77,	May Dec. July Dec. Mar. Apr. Aug. Feb. Mar. Jan. Dec. Oct. Sept. Apr.
Reducing Noise in Transistorized Auto Receivers (H&K) Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K). Three-Phase Power Supply for Mobile Use (Jennings). Time Signals on the Gonset Super 6 (H&K). Transistorized B.F.O. for Mobile Use (H&K). Transistorized Power Supply (Chambers). Feedback. Transistor Mobile Converter (DeMaw). Transmitter Hunting on 75 Meters (Isaacs). Tubless Conversion for 75-Meter Mobile (H&K). Tuning the Heliwhip to Frequency (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Tube Mobile Transmitter (Westrem). Using Film Reels as Capacitive Hats (H&K). Using the Gonset Super-Six Ahead of a Command Receiver (H&K). 100-Watt Transistor Mobile Power Unit (Karl). 6-Meter Hearsemobile, The (Weissbrodt).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 68, 11, 24, 69,	Mar. July Mar. Jan. Aug. Feb. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb. Apr. June	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342. Receiver for the 50-Mc. Man, A (Brandt).  'Simple X Super'' Receiver, The (Goodman). Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K). Squelch Circuit for Hallicrafters S-85 (H&K). Squelch for the NC-300.  Three Modifications for the NC-300 (Hastings). Time Signals on the Gonset Super 6 (H&K). Transformerless Version of W3DM's T.R. Switch (H&K). Transistorized Keying Monitor With Speaker (Tipple). Transistorized Q Multiplier (Campbell). Transistorized Tunable Converter, A (H&K). Transistorized Tunable Converter, A (H&K). Transistorized Tunable Converter, A (H&K). Using the Gonset Super-Six Ahead of a Command Receiver (H&K). Variable Band Width for the Heathkit Q Multiplier (H&K).	43, 68, 14, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51, 64, 63, 77,	May Dec. July Dec. Mar. Apr. Aug. Feb. Mar. Jan. Dec. Oct. Sept. Apr. Apr.
(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K).  Three-Phase Power Supply for Mobile Use (Jennings).  Time Signals on the Gonset Super 6 (H&K).  Transistorized B.F.O. for Mobile Use (H&K).  Transistorized Power Supply (Chambers).  Feedback.  Transistor Mobile Converter (DeMaw).  Transmitter Hunting on 75 Meters (Isaacs).  Tubless Conversion for 75-Meter Mobile (H&K).  Tuning the Heliwhip to Frequency (H&K).  Two-Band Halo for V.H.F. Mobile, A (Tilton).  Two-Tube Mobile Transmitter (Westrem).  Using Film Reels as Capacitive Hats (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  100-Watt Transistor Mobile Power Unit (Karl).  6-Meter Hearsemobile, The (Weissbrodt).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 68, 11, 24, 69,	Mar. July Mar. Jan. Aug. Feb. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342. Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super'' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transformerless Version of W3DM's T.R. Switch (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter, A (H&K).  Transistorized (H&K).  Tubless Conversion for 75-Meter Mobile (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  Variable Band Width for the Heathkit Q Multiplier (H&K)  144-Mc. Converter Design and Adjustment, Hints on (Burson).	43, 68, 14, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51, 64, 63, 77,	May Dec. July Dec. Mar. Apr. Aug. Feb. Mar. Jan. Dec. Oct. Sept. Apr. May
Reducing Noise in Transistorized Auto Receivers (H&K) Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K). Three-Phase Power Supply for Mobile Use (Jennings). Time Signals on the Gonset Super 6 (H&K). Transistorized B.F.O. for Mobile Use (H&K). Transistorized Power Supply (Chambers). Feedback. Transistor Mobile Converter (DeMaw). Transmitter Hunting on 75 Meters (Isaacs). Tubless Conversion for 75-Meter Mobile (H&K). Tuning the Heliwhip to Frequency (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Tube Mobile Transmitter (Westrem). Using Film Reels as Capacitive Hats (H&K). Using the Gonset Super-Six Ahead of a Command Receiver (H&K). 100-Watt Transistor Mobile Power Unit (Karl). 6-Meter Hearsemobile, The (Weissbrodt).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 68, 11, 24, 69,	Mar. July Mar. Jan. Aug. Feb. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342. Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch for the NC-300.  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Q Multiplier (Campbell).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter, A (H&K).  Transistorized Converter (De Maw).  T.R. Switches (H&K).  Tubless Conversion for 75-Meter Mobile (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  Variable Band Width for the Heathkit Q Multiplier (H&K).  144-Mc. Converter Design and Adjustment, Hints on (Burson).  80-Meter Tuner, An (Barnard).	43, 68, 14, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51, 64, 63, 77,	May Dec. July Dec. Mar. Apr. Aug. Feb. Mar. Jan. Dec. Oct. Sept. Apr. May
Reducing Noise in Transistorized Auto Receivers (H&K) Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K). Three-Phase Power Supply for Mobile Use (Jennings). Time Signals on the Gonset Super 6 (H&K). Transistorized B.F.O. for Mobile Use (H&K). Transistorized Power Supply (Chambers). Feedback. Transistor Mobile Converter (DeMaw). Transmitter Hunting on 75 Meters (Isaacs). Tubless Conversion for 75-Meter Mobile (H&K). Tuning the Heliwhip to Frequency (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Tube Mobile Transmitter (Westrem). Using Film Reels as Capacitive Hats (H&K). Using the Gonset Super-Six Ahead of a Command Receiver (H&K). 100-Watt Transistor Mobile Power Unit (Karl). 6-Meter Hearsemobile, The (Weissbrodt).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 68, 11, 24, 69,	Mar. July Mar. Jan. Aug. Feb. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342. Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super'' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch for the NC-300.  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transformerless Version of W3DM's T.R. Switch (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter, A (H&K).  Transistorized Multiplier (Campbell).  T.R. Switches (H&K).  Tubless Conversion for 75-Meter Mobile (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  Variable Band Width for the Heathkit Q Multiplier (H&K)  144-Mc. Converter Design and Adjustment, Hints on (Burson).  80-Meter Tuner, An (Barnard).	43, 68, 14, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51, 64, 63, 77,	May Dec. July Dec. July Dec. Mar. Apr. Mar. July Dec. Oct. Sept. Apr. May July July July July July July July Jul
(H&K). Reducing Noise in Transistorized Auto Receivers (H&K) Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K). Squelch System for the Gonset G-66 (H&K). Three-Phase Power Supply for Mobile Use (Jennings). Time Signals on the Gonset Super 6 (H&K). Transistorized B.F.O. for Mobile Use (H&K). Transistorized Power Supply (Chambers). Feedback. Transistor Mobile Converter (DeMaw). Transistor Hunting on 75 Meters (Isaacs). Tubless Conversion for 75-Meter Mobile (H&K). Tuning the Heliwhip to Frequency (H&K). Tuning the Heliwhip to Frequency (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Tube Mobile Transmitter (Westrem). Using Film Reels as Capacitive Hats (H&K). Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  100-Watt Transistor Mobile Power Unit (Karl). 6-Meter Hearsemobile, The (Weissbrodt).  MODULATION (See Audio-Frequency Equipt. & Design)	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 69, 63, 36, 50,	Mar.  July Mar. Jan. Aug. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb. Apr. June Feb.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342 Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super'' Receiver, The (Goodman) Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K)  Squelch Circuit for Hallicrafters S-85 (H&K) Squelch Circuit for Hallicrafters S-85 (H&K) Squelch for the NC-300 Three Modifications for the NC-300 (Hastings) Time Signals on the Gonset Super 6 (H&K) Transformerless Version of W3DM's T.R. Switch (H&K). Transistorized Keying Monitor With Speaker (Tipple) Transistorized Q Multiplier (Campbell) Transistorized Tunable Converter, A (H&K) Transistorized Tunable Converter, Maw) T.R. Switches (H&K) Tubless Conversion for 75-Meter Mobile (H&K) Using the Gonset Super-Six Ahead of a Command Receiver (H&K) Variable Band Width for the Heathkit Q Multiplier (H&K) 144-Mc. Converter Design and Adjustment, Hints on (Burson) 80-Meter Tuner, An (Barnard)	43, 68, 14, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51, 64, 64, 63, 77, 44, 11,	May Dec. July Dec. July Dec. Mar. Apr. Aug. Feb. Mar. Jan. Dec. Oct. Apr. Apr. May July July July July July July July Jul
(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K) Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K).  Three-Phase Power Supply for Mobile Use (Jennings). Time Signals on the Gonset Super 6 (H&K).  Transistorized B.F.O. for Mobile Use (H&K).  Transistorized Power Supply (Chambers).  Feedback.  Transistor Mobile Converter (DeMaw).  Transmitter Hunting on 75 Meters (Isaacs).  Tubless Conversion for 75-Meter Mobile (H&K).  Tuning the Heliwhip to Frequency (H&K).  Two-Band Halo for V.H.F. Mobile, A (Tilton).  Two-Tube Mobile Transmitter (Westrem).  Using Film Reels as Capacitive Hats (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  100-Watt Transistor Mobile Power Unit (Karl). 6-Meter Hearsemobile, The (Weissbrodt).  MODULATION  (See Audio-Frequency Equipt. & Design)  OPERATING PRACTICES  "Anchoring" the J-38 Key (H&K).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 69, 63, 36, 50,	Mar. July Mar. Jan. Aug. Feb. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342 Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super'' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Greuit for Hallicrafters S-85 (H&K).  Squelch for the NC-300.  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transformerless Version of W3DM's T.R. Switch (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Gultiplier (Campbell).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter (De Maw).  T.R. Switches (H&K)  Tubless Conversion for 75-Meter Mobile (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  Variable Band Width for the Heathkit Q Multiplier (H&K).  144-Mc. Converter Design and Adjustment, Hints on (Burson).  80-Meter Tuner, An (Barnard).  RECENT EQUIPMENT  Amplex KW-62 Amplifier, The.  Centimeg 432-Mc. Receiver, The.	43, 68, 14, 11, 63, 67, 31, 44, 69, 226, 38, 69, 41, 51, 64, 64, 63, 77, 44, 11,	May Dec.  July Dec.  July Dec.  Mar.  Apr.  Aug.  Feb.  Mar.  Dec.  Oct.  Apr.  Apr.  Apr.  July  July  July  July  July
(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K). Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K).  Three-Phase Power Supply for Mobile Use (Jennings). Time Signals on the Gonset Super 6 (H&K).  Transistorized B.F.O. for Mobile Use (H&K).  Transistorized Power Supply (Chambers).  Feedback.  Transistor Mobile Converter (DeMaw).  Transmitter Hunting on 75 Meters (Isaacs).  Tubless Conversion for 75-Meter Mobile (H&K).  Tuning the Heliwhip to Frequency (H&K).  Two-Band Halo for V.H.F. Mobile, A (Tilton).  Two-Tube Mobile Transmitter (Westrem).  Using Film Reels as Capacitive Hats (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  100-Watt Transistor Mobile Power Unit (Karl). 6-Meter Hearsemobile, The (Weissbrodt).  MODULATION  (See Audio-Frequency Equipt. & Design)  OPERATING PRACTICES  "Anchoring" the J-38 Key (H&K).  Automatic "Timer" for the 10-Minute Station Break	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 69, 63, 36, 50,	Mar.  July Mar. Jan. Aug. Feb. Feb. Mar. Oct. June Apr. Dec. Feb. June Feb. Mar.  Mar.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342. Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super'' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch for the NC-300.  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transformerless Version of W3DM's T.R. Switch (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter, A (H&K).  Transistorized H&K).  Tubless Conversion for 75-Meter Mobile (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  Variable Band Width for the Heathkit Q Multiplier (H&K)  144-Mc. Converter Design and Adjustment, Hints on (Burson).  80-Meter Tuner, An (Barnard).  RECENT EQUIPMENT  Amplex KW-62 Amplifier, The.  Central Electronics MM-2 R.F. Analyzer, The	43, 68, 14, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51, 64, 63, 77, 44, 11,	May Dec. July Dec. July Dec. Apr. Aug. Feb. Jan. Dec. Oct. Apr. Apr. Apr. Apr. Apr. Apr. Apr. Apr
(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K).  Three-Phase Power Supply for Mobile Use (Jennings).  Time Signals on the Gonset Super 6 (H&K).  Transistorized B.F.O. for Mobile Use (H&K).  Transistorized Power Supply (Chambers).  Feedback.  Transistor Mobile Converter (DeMaw).  Transistor Mobile Converter (DeMaw).  Transmitter Hunting on 75 Meters (Isaacs).  Tubless Conversion for 75-Meter Mobile (H&K).  Tuning the Heliwhip to Frequency (H&K).  Two-Band Halo for V.H.F. Mobile, A (Tilton).  Two-Tube Mobile Transmitter (Westrem).  Using Film Reels as Capacitive Hats (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  100-Watt Transistor Mobile Power Unit (Karl).  6-Meter Hearsemobile, The (Weissbrodt).  MODULATION  (See Audio-Frequency Equipt. & Design)  OPERATING PRACTICES  "Anchoring" the J-38 Key (H&K).  Automatic "Timer" for the 10-Minute Station Break (H&K).  Contest Operating (LeKashman).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 69, 63, 36, 50,	Mar.  July Mar. Jan. Aug. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb. Apr. June Feb.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342 Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super'' Receiver, The (Goodman) Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K)  Squelch Circuit for Hallicrafters S-85 (H&K) Squelch Circuit for Hallicrafters S-85 (H&K) Squelch for the NC-300 Three Modifications for the NC-300 (Hastings) Time Signals on the Gonset Super 6 (H&K) Transformerless Version of W3DM's T.R. Switch (H&K). Transistorized Keying Monitor With Speaker (Tipple) Transistorized Q Multiplier (Campbell) Transistorized Tunable Converter, A (H&K) Transistorized Tunable Converter, A (H&K) Transistorized Tunable Converter (De Maw) T.R. Switches (H&K) Tubless Conversion for 75-Meter Mobile (H&K) Using the Gonset Super-Six Ahead of a Command Receiver (H&K) Variable Band Width for the Heathkit Q Multiplier (H&K) 144-Mc. Converter Design and Adjustment, Hints on (Burson) 80-Meter Tuner, An (Barnard)  RECENT EQUIPMENT  Amplex KW-62 Amplifier, The Centrial Electronics MM-2 R.F. Analyzer, The Collins KWM-1 Transeciver, The	43, 68, 14, 11, 63, 67, 31, 44, 66, 26, 38, 69, 41, 51, 64, 63, 77, 44, 11,	May Dec. July Dec. July Dec. Mar. Apr. Aug. Feb. Jan. Dec. Sept. Apr. May July July July July July July July Jul
(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K). Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K).  Three-Phase Power Supply for Mobile Use (Jennings).  Time Signals on the Gonset Super 6 (H&K).  Transistorized B.F.O. for Mobile Use (H&K).  Transistorized Power Supply (Chambers).  Feedback.  Transistor Mobile Converter (DeMaw).  Transistor Mobile Converter (DeMaw).  Transmitter Hunting on 75 Meters (Isaacs).  Tubless Conversion for 75-Meter Mobile (H&K).  Tuning the Heliwhip to Frequency (H&K).  Two-Band Halo for V.H.F. Mobile, A (Tilton).  Two-Tube Mobile Transmitter (Westrem).  Using Film Reels as Capacitive Hats (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  100-Watt Transistor Mobile Power Unit (Karl).  6-Meter Hearsemobile, The (Weissbrodt).  MODULATION  (See Audio-Frequency Equipt. & Design)  OPERATING PRACTICES  "Anchoring" the J-38 Key (H&K).  Automatic "Timer" for the 10-Minute Station Break (H&K).  Contest Operating (LeKashman).  How to Top the CD Party! (Hippisley).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 68, 11, 24, 69, 63, 36, 50,	Mar.  July Mar. Jan. Aug. Feb. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb. Apr. June Feb. Apr. June Apr. June	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342 Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super'' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch for the NC-300.  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transformerless Version of W3DM's T.R. Switch (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter (De Maw).  T.R. Switches (H&K).  Tubless Conversion for 75-Meter Mobile (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  Variable Band Width for the Heathkit Q Multiplier (H&K).  144-Mc. Converter Design and Adjustment, Hints on (Burson).  80-Meter Tuner, An (Barnard).  RECENT EQUIPMENT  Amplex KW-62 Amplifier, The.  Centimeg 432-Mc. Receiver, The.  Central Electronics MM-2 R.F. Analyzer, The  Collins KWM-1 Transceiver, The.  Cosmophone 35 Bilateral Transceiver.	43, 68, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51, 64, 63, 77, 44, 11, 31, 44, 44, 47, 23, 44, 44, 47,	May Dec.  July Dec.  July Dec.  Mar.  Apr.  Apr.  Aug.  Feb.  Mar.  Dec.  Oct.  Sept.  Apr.  Apr.  July  Jul
(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K).  Three-Phase Power Supply for Mobile Use (Jennings).  Time Signals on the Gonset Super 6 (H&K).  Transistorized B.F.O. for Mobile Use (H&K).  Transistorized Power Supply (Chambers).  Feedback.  Transistor Mobile Converter (DeMaw).  Transmitter Hunting on 75 Meters (Isaacs).  Tubless Conversion for 75-Meter Mobile (H&K).  Tuning the Heliwhip to Frequency (H&K).  Two-Band Halo for V.H.F. Mobile, A (Tilton).  Two-Tube Mobile Transmitter (Westrem).  Using film Reels as Capacitive Hats (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  100-Watt Transistor Mobile Power Unit (Karl).  6-Meter Hearsemobile, The (Weissbrodt).  MODULATION  (See Audio-Frequency Equipt, & Design)  OPERATING PRACTICES  "Anchoring" the J-38 Key (H&K).  Automatic "Timer" for the 10-Minute Station Break (H&K).  Contest Operating (LeKashman).  How to Top the CD Party! (Hippisley).  Method for Scoring Hidden Transmitter Hunts, A	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 69, 63, 36, 50,	Mar.  July Mar. Jan. Aug. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb.  Apr. June Apr. June Apr. June Apr. June Feb.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342. Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super'' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Grein the NC-300.  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transformerless Version of W3DM's T.R. Switch (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Q Multiplier (Campbell).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter, A (H&K).  Transistorized Super-Six Ahead of a Command Receiver (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  Variable Band Width for the Heathkit Q Multiplier (H&K)  144-Mc. Converter Design and Adjustment, Hints on (Burson).  80-Meter Tuner, An (Barnard).  RECENT EQUIPMENT  Amplex KW-62 Amplifier, The Central Electronics MM-2 R.F. Analyzer, The Collins KWM-1 Transceiver, The Collins KWM-1 Transceiver, The Collins KWM-1 Transceiver, The Collins KWM-1 Transceiver, The Cosmophone 35 Bilateral Transceiver  Eldico SSB-100F Transmitter.  Filter-King 6-Meter Converter, The	43, 68, 11, 63, 67, 31, 44, 69, 26, 38, 69, 41, 51, 64, 63, 77, 44, 11, 31, 44, 44, 47, 23, 44, 44, 47,	May Dec.  July Dec.  July Dec.  Mar.  Apr.  Apr.  Apr.  Apr.  Apr.  May  July  June  Feb.
(H&K).  Reducing Noise in Transistorized Auto Receivers (H&K). Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch System for the Gonset G-66 (H&K).  Three-Phase Power Supply for Mobile Use (Jennings).  Time Signals on the Gonset Super 6 (H&K).  Transistorized B.F.O. for Mobile Use (H&K).  Transistorized Power Supply (Chambers).  Feedback.  Transistor Mobile Converter (DeMaw).  Transistor Mobile Converter (DeMaw).  Transmitter Hunting on 75 Meters (Isaacs).  Tubless Conversion for 75-Meter Mobile (H&K).  Tuning the Heliwhip to Frequency (H&K).  Two-Band Halo for V.H.F. Mobile, A (Tilton).  Two-Tube Mobile Transmitter (Westrem).  Using Film Reels as Capacitive Hats (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  100-Watt Transistor Mobile Power Unit (Karl).  6-Meter Hearsemobile, The (Weissbrodt).  MODULATION  (See Audio-Frequency Equipt. & Design)  OPERATING PRACTICES  "Anchoring" the J-38 Key (H&K).  Automatic "Timer" for the 10-Minute Station Break (H&K).  Contest Operating (LeKashman).  How to Top the CD Party! (Hippisley).	60, 63, 59, 28, 64, 67, 36, 52, 41, 38, 64, 69, 63, 36, 50,	Mar.  July Mar. Jan. Aug. Feb. Mar. Oct. June Apr. Dec. Sept. Dec. Feb.  Apr. June Apr. June Apr. June Apr. June Feb.	Pierson KE-93 Receiver, The (Rec. Equip.)  Q Multiplier for BC-312 or BC-342. Receiver for the 50-Mc. Man, A (Brandt)  'Simple X Super'' Receiver, The (Goodman).  Simple 12-Volt Mobile Converter for 75 and 40 Meters (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Circuit for Hallicrafters S-85 (H&K).  Squelch Great for the NC-300.  Three Modifications for the NC-300 (Hastings).  Time Signals on the Gonset Super 6 (H&K).  Transformerless Version of W3DM's T.R. Switch (H&K).  Transistorized Keying Monitor With Speaker (Tipple).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter, A (H&K).  Transistorized Tunable Converter (De Maw).  T.R. Switches (H&K).  Tubless Conversion for 75-Meter Mobile (H&K).  Using the Gonset Super-Six Ahead of a Command Receiver (H&K).  Variable Band Width for the Heathkit Q Multiplier (H&K).  144-Mc. Converter Design and Adjustment, Hints on (Burson).  80-Meter Tuner, An (Barnard).  RECENT EQUIPMENT  Amplex KW-62 Amplifier, The.  Central Electronics MM-2 R.F. Analyzer, The  Collins KWM-1 Transceiver, The.  Collins KWM-1 Transmitter.  Filter-King 6-Meter Converter, The.	43, 68, 14, 11, 63, 67, 31, 44, 64, 69, 41, 51, 64, 63, 77, 44, 11, 44, 47, 23, 44, 41,	May Dec. July Dec. July Dec. July Dec. Mar. Apr. Aug. Feb. Apr. Apr. May July July July July July July July Jul

Globe Sidebander DSB-100	40,	Dec.	Ten-Meter Transistorized Phone Transmitter (Gilbert)	36,	Dec.
Gonset Communicator III, The	39,	Mar.	Transistor Handitalky for Ten Meters, A (Von Wald)	11,	Mar.
Gonset V.H.F. V.F.O., Model 3226	45,	Sept.	Two-Tube Mobile Transmitter (Westrem)		Dec.
Hammarlund HQ-110, The	46,	Aug.	Versatile 50-Mc. Transmitter, A (Tilton)		Oct.
Hammarlund HQ-160, The		Oct.	Viking Navigator, The (Prec. Equip.)	46,	May
Heath Mohawk Receiver Kit, The		Dec.			
Johnson Directional Coupler and Indicator		Nov.	TRANSMITTING		
Johnson Thunderbolt, The		July	IMANDMITING		
Johnson 250-39 T.R. Switch		Sept.	All-Purpose 813 Amplifier, An (Thomason)	35,	Aug.
Knight Receiver, The		Nov.	Capacitive Neutralizing Hint (H&K)	60,	Mar.
National NC-109 Receiver, The		Jan.	Desk-Top 650-Watt Amplifier, A (Lomasney)	38,	Sept.
National VFO-62, The		July Mar.	DX-100 Keying (H&K)		Feb.
Pierson KE-93 Receiver, The		May	Flexible Transmitter-Receiver Frequency Control (Jones)		July
RME Model 4350A Receiver, The		Sept.	Feedback		Sept.
Tecraft V.H.F. Converters, The		Nov.	How To Tune Your Pi-Network Final (McCoy)		Febe
Viking Courier, The		Aug.	Improved Control Circuits for the DX-35 (H&K)		Jun.
Viking Navigator, The		May	Keep It Clean (H&K)		Dec.
		-	Medium-Power R. F. Amplifier, A (Mix)		Feb.
REGULATIONS			Multiple Position Crystal Holder (H&K)		Mar.
ADDI Eiler en MM Drenesel	79	Morr	Neutralizing Hints (H&K)		May
ARRL Files on MM Proposal		May Jan.	Pi-Network Tank Design (Wulf)		Sept.
Examination Schedule, 1958			Push-to-Talk for the Communicator I and II (H&K)		Dec.
Minor RACES Rules Change			Reducing Key Clicks in Cathode Keyed Transmitters	,	
MM Expansion Proposed			(H&K)	52,	Sept.
Portable Rules Changes			Screen-Grid Protection With a Surplus Relay (H&K)	64,	July
Portable Rules for Filing	58,	_	Screen Protection (Tech. Topics)	184,	Dec.
U.H.F. Changes	63,	_	Simple Grid Current Indicator for Class AB Linear Am-		
WA2ABC de WV6DEF	72,		plifiers		Feb.
1800–2000 Kc. Changes	64,	June	Two Linear Amplifiers	,	Mar.
1958 Exam Schedule	56,	July	Variable Frequency Oscillator, A (Baldwin)		Nov.
27-Mc. Band Deleted	78,	Oct.	VXO — A Variable Crystal Oscillator (Shall)	11,	Jan.
G T M T T T T T T T T T T T T T T T T T			Wide Range Loading Capacitance Using Only Four Ca-	70	Man
SATELLITES			pacitors (H&K)		May Aug.
Amateur Satellite Reception and Recording (Dearborn)			6146 Beam Power Tube, Longer Life for the (H&K)	,	Nov.
(Tech. Corres.)	44,	Dec.	of to beam fower rube, honger the for the (frest)	. 1,	1101.
C.A.P. Satellite Data	59,	Apr.			
Microlock	70,	May	V.H.F. & MICROWAVES		
Minitrack Station of the Sohio Moonbeam Group		Apr.	Adjustment Procedures for V.H.F. Converters (Frye)	9.4	Oct
Minitrack Systems	60,		Directional Coupler for 144 Mc., A		Oct.
Observations Wanted on "Ghost Satellite"	67,	July	Easy-To-Build 108 Mc. Converter, An (Campbell)		Feb.
Opportunity for Amateur Participation in IGY Satellite	00	11	Gonset Communicator III, Notes on the (H&K)		Oct.
Program, An		Mar.	High-Level Mixer for 144-Mc. S.S.B.		Sept.
Satellite Notes	10,	Mar.	High Power on 220 Mc. with the 4CX300A (Clark)		Apr.
CINCLE CIDEDAND			Improved V.H.F. Coil for Grid-Dip Meters (Newland)	36,	
SINGLE SIDEBAND			Improving Performance of Crystal-Controlled V.H.F.		1
Balanced Modulator for the W1JEO Exciter, A (H&K)	77,	Oct.	Converters (Tilton)	27,	Feb.
BC-221 as a Carrier Injection Generator for S.S.B. (H&K)	59,		Improving the "Club-Saver" Two-Meter Portable		
Cheap and Easy Sideband, 1958	28,		(Frieders)		May
Some Experiences With	22,		Let's Go Microwave (Bredon)		June
Cheap and Easy Sideband (Kelly) (Tech. Corres.)		Sept.	Modifying the Viking Adventurer for 50 Mc. (Brogdon)	22.	Sept.
Choosing Capacitors (Geiser)	22,	July		,	
TT LT LAC C. 144 AC CCD	00		New Thresholds in V.H.F. and U.H.F. Reception		D
High-Level Mixer for 144-Mc. S.S.B.		Sept.	(Bateman, Bain)	30,	Dec.
Novel Sideband Selector System, A (Alvernaz)	19,	Sept. May	(Bateman, Bain)	30, 18,	Mar.
Novel Sideband Selector System, A (Alvernaz) Sideband Package, A (Bigler)	19,	Sept.	(Bateman, Bain)	30, 18, 71,	Mar. Dec.
Novel Sideband Selector System, A (Alvernaz)	19, 24,	Sept. May June	(Bateman, Bain). Obstacle Gain Techniques for 50 Mc. and Higher (Craig) Push-to-Talk for the Communicator I and II (H&K) Receiver for the 50-Mc. Man, A (Brandt)	30, 18, 71, 14,	Mar. Dec. July
Novel Sideband Selector System, A (Alvernaz) Sideband Package, A (Bigler)	19, 24,	Sept. May	(Bateman, Bain) .  Obstacle Gain Techniques for 50 Mc. and Higher (Craig) .  Push-to-Talk for the Communicator I and II (H&K)  Receiver for the 50-Mc. Man, A (Brandt) .  Sporadic-E-Skip on 200 Mc.? (Cooper)	30, 18, 71, 14, 33,	Mar. Dec.
Novel Sideband Selector System, A (Alvernaz)	19, 24, 67,	Sept. May June	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K) Receiver for the 50-Mc. Man, A (Brandt) Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton).	30, 18, 71, 14, 33, 60,	Mar. Dec. July Nov.
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).	19, 24, 67,	Sept. May June Feb.	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K).	30, 18, 71, 14, 33, 60, 11, 68,	Mar. Dec. July Nov. Mar.
Novel Sideband Selector System, A (Alvernaz)	19, 24, 67,	Sept. May June Feb.	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K) Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper) "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F., Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for	30, 18, 71, 14, 33, 60, 11, 68,	Mar. Dec. July Nov. Mar. Sept. Dec.
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS	19, 24, 67, 62,	Sept. May June Feb. Apr.	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K).	30, 18, 71, 14, 33, 60, 11, 68,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug.
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS Checking Transistors (Priebe).	19, 24, 67, 62,	Sept. May June Feb.	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E-Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F., Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf)	30, 18, 71, 14, 33, 60, 11, 68,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb.
Novel Sideband Selector System, A (Alvernaz)	19, 24, 67, 62,	Sept. May June Feb. Apr.	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K) Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F., Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton).	30, 18, 71, 14, 33, 60, 11, 68, 64, 22, 16,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct.
Novel Sideband Selector System, A (Alvernaz)	19, 24, 67, 62, 20,	Sept. May June Feb. Apr. Apr.	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton). V.H.F. Crystal Oscillator (H&K).	30, 18, 71, 14, 33, 60, 11, 68, 64, 22, 16, 72,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct. Nov.
Novel Sideband Selector System, A (Alvernaz)	19, 24, 67, 62, 20,	Sept. May June Feb. Apr.	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E-Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton). V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor).	30, 18, 71, 14, 33, 60, 11, 68, 64, 22, 16, 72, 28,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct. Nov. Dec.
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS Checking Transistors (Priebe). High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert).	19, 24, 67, 62, 20, 11, 36,	Sept. May June Feb. Apr. Apr.	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton) V.H.F. Crystal Oscillator (H&K). Working Ionospherio Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt).	30, 18, 71, 14, 33, 60, 11, 68, 64, 22, 16, 72, 28,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct. Nov. Dec.
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS Checking Transistors (Priebe) High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert). "Transimatic"—A Transistorized Automatic Keyer, The (Coale). Transistorized Frequency Marker (Johnson).	19, 24, 67, 62, 20, 11, 36, 37, 16,	Sept. May June Feb. Apr. Apr. Dec. Apr. Feb.	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton) V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt). 50-Mc. Station for the Beginner (McCoy)	30, 18, 71, 14, 33, 60, 11, 68, 64, 22, 16, 72, 28, 50,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct. Nov. Dec. Feb.
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS Checking Transistors (Priebe). High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert). "Transimatic"—A Transistorized Automatic Keyer, The (Coale). Transistorized Frequency Marker (Johnson). Transistorized Grid-Dip Meter, A, (Neben).	19, 24, 67, 62, 20, 11, 36, 37, 16, 34,	Sept. May June Feb. Apr. Apr. Dec. Apr. Feb. June	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton). V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt). 50-Mc. Station for the Beginner (McCoy) Part I.	30, 18, 71, 14, 33, 60, 11, 68, 64, 22, 16, 72, 28, 50,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct. Nov. Dec. Feb.
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K).  S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS  Checking Transistors (Priebe). High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert). "Transistorized Frequency Marker (Johnson). Transistorized Frequency Marker (Johnson). Transistorized Grid-Dip Meter, A, (Neben). Transistorized Tunable Converter, A (H&K).	19, 24, 67, 62, 20, 11, 36, 37, 16, 34, 69,	Sept. May June Feb. Apr. Apr. Dec. Apr. Feb. June	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E-Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton). V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt). 50-Mc. Station for the Beginner (McCoy) Part I. Part II.	30, 18, 71, 14, 33, 60, 11, 68, 64, 22, 16, 72, 28, 50, 22,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct. Nov. Dec. Feb. Apr.
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS Checking Transistors (Priebe). High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert). "Transimatic" — A Transistorized Automatic Keyer, The (Coale). Transistorized Frequency Marker (Johnson). Transistorized Frequency Marker (Johnson). Transistorized Tunable Converter, A (H&K). Transistor Power Supply (Karl) (Tech. Corres.).	19, 24, 67, 62, 20, 11, 36, 37, 16, 34, 69, 25,	Sept. May June Feb. Apr. Apr. Dec. , Apr. Feb. June	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton). V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt). 50-Mc. Station for the Beginner (McCoy) Part I. Part II.	30, 18, 71, 14, 33, 60, 11, 68, 64, 22, 16, 72, 28, 50, 30, 22,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct. Nov. Dec. Feb. Apr. May
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K).  S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS  Checking Transistors (Priebe). High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert). "Transistorized Frequency Marker (Johnson). Transistorized Frequency Marker (Johnson). Transistorized Grid-Dip Meter, A, (Neben). Transistorized Tunable Converter, A (H&K).	19, 24, 67, 62, 20, 11, 36, 37, 16, 34, 69, 25,	Sept. May June Feb. Apr. Apr. Dec. Apr. Feb. June	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E-Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton). V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt). 50-Mc. Station for the Beginner (McCoy) Part I. Part II.	30, 18, 71, 14, 33, 60, 11, 68, 64, 22, 16, 72, 28, 50, 22,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct. Nov. Dec. Feb. Apr. May
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS  Checking Transistors (Priebe). High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert). "Transimatic" — A Transistorized Automatic Keyer, The (Coale). Transistorized Frequency Marker (Johnson). Transistorized Grid-Dip Meter, A, (Neben). Transistorized Tunable Converter, A (H&K). Transistor Power Supply (Karl) (Tech. Corres.). 100-Watt Transistor Mobile Power Unit (Karl).	19, 24, 67, 62, 20, 11, 36, 37, 16, 34, 69, 25,	Sept. May June Feb. Apr. Apr. Dec. , Apr. Feb. June	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton). V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt). 50-Mc. Station for the Beginner (McCoy) Part I. Part II. 144-Mc. Converter Design and Adjustment, Hints on (Burson). World Above 50 Mc., The	30, 18, 71, 14, 33, 60, 11, 68, 64, 22, 16, 72, 28, 50, 30, 22, 44,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct. Nov. Dec. Feb. Apr. May
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS Checking Transistors (Priebe). High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert). "Transimatic"—A Transistorized Automatic Keyer, The (Coale). Transistorized Frequency Marker (Johnson). Transistorized Grid-Dip Meter, A, (Neben). Transistorized Tunable Converter, A (H&K). Transistor Power Supply (Karl) (Tech. Corres.). 100-Watt Transistor Mobile Power Unit (Karl).	19, 24, 67, 62, 20, 11, 36, 37, 16, 34, 69, 25,	Sept. May June Feb. Apr. Apr. Dec. , Apr. Feb. June	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton). V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt). 50-Mc. Station for the Beginner (McCoy) Part I. Part II. 144-Mc. Converter Design and Adjustment, Hints on (Burson). World Above 50 Mc., The Coaxial Tank for 50 Mc. East Coast to Hawaii on 50 Mc.	30, 18, 71, 14, 33, 36, 60, 11, 68, 64, 22, 16, 72, 28, 50, 30, 22, 44, 76, 62,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct. Nov. Dec. Feb. Apr. May
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS Checking Transistors (Priebe). High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert). "Transimatic"—A Transistorized Automatic Keyer, The (Coale). Transistorized Frequency Marker (Johnson). Transistorized Frequency Marker (Johnson). Transistorized Transible Converter, A (H&K). Transistor Power Supply (Karl) (Tech. Corres.). 100-Watt Transistor Mobile Power Unit (Karl).  TRANSMITTERS Cheap and Easy Sideband, 1958.	19, 24, 67, 62, 20, 11, 36, 37, 16, 34, 69, 25, 36,	Sept. May June Feb. Apr. Apr. Pec. Apr. Feb. June Dec. Sept. June May	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F., Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton). V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt). 50-Mc. Station for the Beginner (McCoy) Part I. Part II. 144-Mc. Converter Design and Adjustment, Hints on (Burson). World Above 50 Mc., The Coaxial Tank for 50 Mc. East Coast to Hawaii on 50 Mc. Helical Elements in 6-Meter Antennas.	30, 18, 71, 14, 33, 360, 11, 68, 64, 22, 16, 72, 28, 50, 22, 44, 76, 62, 69,	Mar. Dec. July Nov. Mar. Sept. Dec.  Aug. Feb. Oct. Nov. Dec. Feb. Apr. May July
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS Cheeking Transistors (Priebe). High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert). "Transimatic"—A Transistorized Automatic Keyer, The (Coale). Transistorized Frequency Marker (Johnson). Transistorized Frequency Marker (Johnson). Transistorized Tunable Converter, A (H&K). Transistorized Tunable Converter, A (H&K). Transistor Power Supply (Karl) (Tech. Corres.). 100-Watt Transistor Mobile Power Unit (Karl).  TRANSMITTERS Cheap and Easy Sideband, 1958. Some Experiences With.	19, 24, 67, 62, 20, 11, 36, 37, 16, 34, 69, 25, 36,	Sept. May June Feb. Apr. Apr. Pec. Apr. Feb. June Dec. Sept. June May	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E-Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton) V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt). 50-Mc. Station for the Beginner (McCoy) Part I. Part II. 144-Mc. Converter Design and Adjustment, Hints on (Burson). World Above 50 Mc., The Coaxial Tank for 50 Mc. East Coast to Hawaii on 50 Mc. Helical Elements in 6-Meter Antennas. Horizontal Dipole for the Communicator.	30, 18, 71, 14, 33, 60, 11, 68, 62, 22, 16, 72, 28, 50, 22, 44, 76, 62, 69, 78,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct. Nov. Dec. Feb. Apr. May July June Mar. Sept. Feb.
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K).  S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS  Checking Transistors (Priebe). High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert). "Transimatic"—A Transistorized Automatic Keyer, The (Coale). Transistorized Frequency Marker (Johnson). Transistorized Grid-Dip Meter, A, (Neben). Transistorized Tunable Converter, A (H&K). Transistorized Tunable Converter, A (H&K). Transistor Power Supply (Karl) (Tech. Corres.). 100-Watt Transistor Mobile Power Unit (Karl).  TRANSMITTERS  Cheap and Easy Sideband, 1958. Some Experiences With. "Customizing" the 6L6GB Handbook Transmitter (Kor-	19, 24, 67, 62, 20, 11, 36, 37, 16, 34, 69, 25, 36,	Sept. May June Feb. Apr. Apr. Apr. Dec. Apr. Feb. June Dec. Sept. June	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F. Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TY Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton). V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt). 50-Mc. Station for the Beginner (McCoy) Part I. 144-Mc. Converter Design and Adjustment, Hints on (Burson). World Above 50 Mc., The Coaxial Tank for 50 Mc. East Coast to Hawaii on 50 Mc. Helical Elements in 6-Meter Antennas Horizontal Dipole for the Communicator. Overtone Oscillator for the SCR-522	30, 18, 71, 14, 33, 60, 11, 68, 62, 22, 16, 72, 28, 50, 22, 44, 76, 62, 69, 78, 69,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Feb. Oct. Nov. Dec. Feb. Apr. May July June Mar. Sept. Feb. Jan.
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS Checking Transistors (Priebe). High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert). "Transimatic" — A Transistorized Automatic Keyer, The (Coale). Transistorized Frequency Marker (Johnson). Transistorized Frequency Marker (Johnson). Transistorized Grid-Dip Meter, A, (Neben). Transistorized Tunable Converter, A (H&K). Transistor Power Supply (Karl) (Tech. Corres.). 100-Watt Transistor Mobile Power Unit (Karl).  TRANSMITTERS Cheap and Easy Sideband, 1958. Some Experiences With "Customizing" the 6L6GB Handbook Transmitter (Korper).	19, 24, 67, 62, 20, 11, 36, 37, 16, 34, 69, 25, 36,	Sept. May June Feb. Apr. Apr. Pec. Apr. Feb. June Dec. Sept. June May Jan. May	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E-Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F., Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton). V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt). 50-Mc. Station for the Beginner (McCoy) Part I. Part II. 144-Mc. Converter Design and Adjustment, Hints on (Burson). World Above 50 Mc., The Coaxial Tank for 50 Mc. East Coast to Hawaii on 50 Mc. Helical Elements in 6-Meter Antennas. Horizontal Dipole for the Communicator. Overtone Oscillator for the SCR-522 Feedback.	30, 18, 71, 14, 33, 60, 11, 68, 64, 22, 16, 72, 28, 50, 22, 44, 76, 62, 69, 78, 69, 148,	Mar. Dec. July Nov. Mar. Sept. Dec. Aug. Nov. Mov. Dec. Feb. Oct. Nov. Dec. Feb. July June Mar. Sept. Feb. May Mar. Mar. Mar. Mar. Mar. Mar. Mar. Mar.
Novel Sideband Selector System, A (Alvernaz). Sideband Package, A (Bigler) Simple grid Current Indicator for Class AB Linear Amplifiers (H&K). S.S.B. Reception With the Universal Service Product Detector and Collins 75-A3, Re. (H&K).  TRANSISTORS  Checking Transistors (Priebe) High-Power Transistorized Mobile Power Supply (Johnson). Ten-Meter Transistorized Phone Transmitter (Gilbert). "Transimatic"—A Transistorized Automatic Keyer, The (Coale). Transistorized Frequency Marker (Johnson). Transistorized Grid-Dip Meter, A, (Neben). Transistorized Tunable Converter, A (H&K). Transistorized Tunable Converter, A (H&K). Transistor Power Supply (Karl) (Tech. Corres.). 100-Watt Transistor Mobile Power Unit (Karl).  TRANSMITTERS  Cheap and Easy Sideband, 1958. Some Experiences With. "Customizing" the 6L6GB Handbook Transmitter (Korper). Novice 50 Watter, The (McCoy).	19, 24, 67, 62, 20, 11, 36, 37, 16, 34, 69, 25, 36,	Sept. May June Feb. Apr. Apr. Pec. Apr. Feb. June Dec. Sept. June May Jan. May Dec.	(Bateman, Bain) Obstacle Gain Techniques for 50 Mc. and Higher (Craig). Push-to-Talk for the Communicator I and II (H&K). Receiver for the 50-Mc. Man, A (Brandt). Sporadic-E-Skip on 200 Mc.? (Cooper). "Tee" Trap for V.H.F., A (H&K). Two-Band Halo for V.H.F., Mobile, A (Tilton). Two-Meter Ground Plane (H&K). "Umbrella for Two": Novel Ground-Plane Antenna for 144 Mc. (H&K). Using TV Signals in V.H.F. Propagation Studies (Graf). Versatile 50-Mc. Transmitter, A (Tilton) V.H.F. Crystal Oscillator (H&K). Working Ionospheric Scatter on 50 Mc. (Taylor). 6-Meter Hearsemobile, The (Weissbrodt). 50-Mc. Station for the Beginner (McCoy) Part I. Part II. 144-Mc. Converter Design and Adjustment, Hints on (Burson). World Above 50 Mc., The Coaxial Tank for 50 Mc. East Coast to Hawaii on 50 Mc. Helical Elements in 6-Meter Antennas. Horizontal Dipole for the Communicator. Overtone Oscillator for the SCR-522 Feedback. Putting the DX-35 on 50 Mc.	30, 18, 71, 14, 33, 60, 11, 68, 64, 22, 16, 72, 28, 50, 30, 22, 44, 76, 62, 69, 78, 69, 148, 93,	Mar. Dec. July Nov. Mar. Sept. Sept. Dec. Oct. Nov. Dec. Feb. Apr. May July June Mar. Sept. Sept. Feb. Jan. Mar. Dec. Dec. Dec. Dec. Dec. Dec. Feb. Dec. Dec. Teb. Dec. Dec. Dec. Dec. Dec. Dec. Dec. Dec
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## NEW NATIONAL NC-303

- NEW front panel SSB selector with exclusive, new "IF SHIFT" for instant sideband choice... eliminates retuning or detuning.
- "Q" Multiplier provides razor-sharp rejection notch (more than 60 db deep). May be tuned continuously across entire receiver passband. Separate notch frequency and notch depth controls.
- SSB-1, SSB-2, medium and broad selectivity.

  5 Kc, 2 Kc, 4 Kc and 8 Kc bandwidths provide optimum selectivity for SSB, CW, phone, phone net and VHF plus sideband selection.
- NEW dual noise limiters. Separate automatic noise limiters for AM. Separate double-ended manual limiter for CW and SSB.
- **NEW** tone switch provides for attenuation of highs, lows, or both for maximum readability.
- NEW exclusive WWV converter provision.
  No interference with dial calibration or frequency coverage. Accessory calibrator provides one microvolt sensitivity on 10 mc WWV frequency.
- **7 NEW** hi-speed, 40-1 tuning dial with logging scale.
- NEW fine tuning vernier dial drive provides super-precision for CW and SSB tuning.

#### ADDITIONAL FEATURES:

Dual conversion on all bands. Crystal controlled 2nd converter oscillator. Giant, slide-rule dial with ten dial scales covers 160 to 11/4 meters, easily readable to 2 kc without interpolation up to 21.5 mc. Exclusive converter provision for 6, 2 and 11/4 meters. Separate linear detector for SSB, will not block with RF gain full open. Giant "S" meter. Provision for external control of RF gain automatically during transmitting periods. Muting provision for CW break-in operation. Calibration reset adjustable from front panel. Socket for plug-in crystal and WWV calibrator. Accessory socket for powering converters and future accessories. Fifteen tubes including rectifier.

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# 5-9 greetings for '59

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PORATION OF AMERICA Harrison, N.J.

KIHWQ K2LOA K2ABB K2LOS K2ACS K2LPQ W2ADY W2LSH WA2AEE K2MOI WA2AEF W2NII WA2AGC W2NKD K2AH K2OAS WA2AKQ W2OKO WA2ALP K2OPN K2ANB K2OPV WV2ASE KN2OUH K2AUM W2OUY WA2AVT K2OZL W2BC K2OZW WA2BDE W2PGW W2PMP K2BGO K2BJN K2POD WV2BLT K2PPF W2BMA KN2PRU K2BTM W2PUD W2BVJ W2PYI W2BVS K2QAU W2CBL W2QEX W2CDP K2QLK K2CTU W2QWH K2CUB K2QYN K2CUD K2QYO K2CVF K2QYP W2CWC W2RBO K2CXG KN2RIV W2CYR K2RME K2DDW K2RMF K2DEX K2RMH K2DKY K2RMK K2DKZ K2RML K2DLE K2RNO K2DLP K2RRE K2DLQ K2RVX K2DMK K2RVZ K2DQX W2RYI W2DTN K2SAU KN2DXF W2SGR KN2DXG K2SKF K2EFC K2SKK W2EGB K2SUV K2EHF K2SZH K2EIR KN2TEM K2EIW K2TJF K2TLM K2ENZ K2ETF W2TMP K2FF W2TVU W2FZV W2UIJ W2FZY W2VHU W2GCV K2VMD K2GHW W2VYF KN2GLH W2WCT W2GOQ W2WPV K2GUD W2YM W2HDZ K2ZON W2HEA K2ZYQ **К2ННН** K3AKI K2HKQ W3ATW K2HKT K3AWH K2HR K3BEU W2IAR K3BWM W2IBB K3CBG W2IET K3CPK K2ISK W3EOB W2IYG W3EWR K2JCF K3EWV-W2JHB W3FAL K2JIP W3FEI KN2JIU W3FEY W2JSX W3FSE W2KCN W3FSS W2KDW W3GJA K2KFZ **W3HXY** W2KRJ W9VIA W3IGJ KN2LAP W9ZEE W3JYL

W3KFI W3KKG W3KRA W3LCA W3LIL W3MZI WINOI WINOK W3OXG W3PNJ W3PPM W3PSK W3RDS W3RRV W3SCG W3SUR W3TFN W3VDY W3UNK W3VOP W3VQH W3YAM W3ZOH W4VI W6AEK K6CQH K6CWZ K6DIU K6MIG W6MJN W6MQS WONVN W6NXK W6NZI W6OKL K6QMK K6RAV W6RYE K6SUT K6TAC W6TVQ W6UXN K6YCN K8BON K8DK7 W8KKE W80KN W8SUF W9AHW W9AYD K9BMF K9BTO W9CLP W9CMQ W9DNC W9EEP K9EZS W9GZE W9HNW W9HPO W9HRA K9IEU K9IEW KN9JTO K9KJE W9KNM K9LQT W9LTS W9MXV WANAM WINTE WANTS W90UN W9PNA W9QLP WYRNU W9SJQ W9UCT